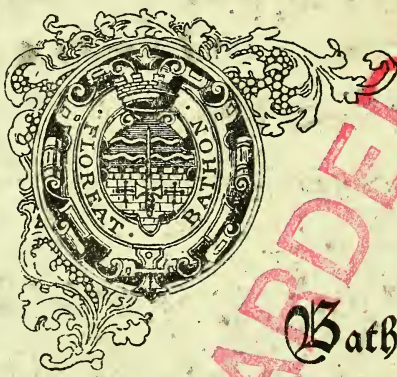
The Book of Climates

D. H. Cullimore



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BY

D. H. CULLIMORE, M.D., M.R.C.P. Lond. and Dub.,

F.R.C.S.I. Surgeon of H.M. Indian Army (Retired);
Late Senior Physician, North-West London Hospital;
Formerly Consulting Physician to the King of Burmah.

SECOND EDITION,

WITH A CHAPTER ON THE CLIMATE OF AFRICA AS IT AFFECTS EUROPEANS,

By SURGEON PARKE, D.C.L.,

late of Stanley's Expedition.



LONDON:
BAILLIÈRE, TINDALL, AND COX.
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PREFACE TO THE SECOND EDITION.

In issuing a second edition of the 'Book of Climates,' I wish particularly to thank the Reviewers, who, with one exception, have spoken most highly of the first.

The new edition not only contains a chapter giving the views of Dr. Parke, late of Stanley's Expedition, on the climate of Africa as it affects Europeans, but also much additional matter on the climate of those countries in South Central Africa which are now being rapidly opened up to civilization by colonists from Cape Colony and the Old Country. There are also remarks on fevers.

D. H. CULLIMORE,

27, Welbeck Street, Cavendish Square.

January, 1891.

PREFACE TO THE FIRST EDITION.

The object of this work is to give a concise, clear, and useful account, one which will be acceptable alike to the profession and the public, of the climates of the different countries of the globe, their salubrity, health resorts, mineral springs, and prevailing diseases.

No such work has yet appeared in the English language; and as the author has been led to its compilation, not only on this account, but owing to his being frequently consulted —not only by invalids, but also by tourists, travellers (as Dr. Lauder Brunton, on proceeding to India), and emigrants intending to settle in countries beyond the seas—he ventures to hope that it will supply a long-felt want, and attain a fair measure of success. The greatest difficulty encountered has been to keep it within the limits prescribed by the publishers, and the needs and purchasing capacity of the profession and public, and to render the descriptions at the same time interesting, intelligible, and useful.

All the introductory chapter, on climate in general, and the descriptions of the climates of Hindoo-China, Iceland, the Riviera, and most of the French, Swiss, Italian, and Spanish resorts, have been condensed or enlarged from the author's own writings, as they appeared either in his work on 'Consumption as a Contagious Disease,' or from time to time in the columns of the *Lancet*, *British Medical Journal*, and *Medical Press and Circular*. The author has travelled extensively in Europe, Asia, Africa and America, and has resided in India, Burmah, and on the Riviera. He has also been familiar, as a ship's surgeon, with the good results and drawbacks incident to a life on the ocean wave. Notwith-

standing these advantages, he has still been obliged to lay under contribution the writings of many eminent authors, both lay and professional, as well as the columns of the leading English medical journals, and the Archives Navales Médicales of Paris. To these, to the different authors of the articles in the *Encyclopædia Britannica*, and to the writers of various pamphlets dealing with local health resorts and bathing stations, the author begs to return his thanks. Amongst the works consulted were those of the late Dr. McPherson, Drs. Theodore Williams, Herman Weber, Symes Thompson, Burney-Yeo, Gordon, C.B., Marcet, Broadbent, Hill-Hassall; the late Surgeon-General Balfour, of Madras; Drs. Bryden, Stephen, King, and Alexander Porter, and Sir Ranald Martin, all of the Indian Service; Dr. Jamieson, Henderson Hanson, and other officers of the Chinese Customs Service; the Army Medical Reports; the Colonial Reports; Dr. Day, of Redcar; Dr. Freeman, of Bath; Drs. Myrtle and Oliver, of Harrogate; Dr. Francis Smith, of Leamington; the 'Provincial Medical Journal'; Dr. Robertson, of Buxton; Drs. Parkes and De Chammont, late of Netley; Drs. Jourdanet, Jules Rochard, and Jusset, of the French Navy, all of Paris; Drs. Hirsch and Oertel, of Germany; Dr. Paul Rodet, of Vittel; Dr. James, author of 'Climate of America'; Dr. Mapother (on 'Skin Diseases'), and many others. My best thanks are also due to the Rev. John B. Macluskey, St. John's Rectory, Glasgow, for reading the proofs of the first half of the work. In view of the appearance of a second edition, pamphlets dealing with local climates will be thankfully received.

D. H. CULLIMORE,

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and San Remo,
Italy.

June 1st, 1890.

CONTENTS.

CHAPTER I.

PAGE

The Influence of the Sun—The Effects of Heat on the Functions of the Body—Effects of Heat in producing Active Disease—Secondary Causes of Climate, as Elevation of the Land, Influence of the Sea, Winds, Rainfall, Moisture, Configuration of the Surface, Soil, and Purity of the Air—Main Characteristics of Climates - 1

CHAPTER II.

Mineral Waters — Baths — Whey, Grape, and other Cures, and Massage - - - - - - - - - 35

CHAPTER III.

The Climate of England, Scotland, and Ireland—Health Resorts and Mineral Springs—The Channel Islands - - - 49

CHAPTER IV.

The Climate of France, with its Health Resorts and Mineral Springs, except the Riviera - - - - - - 79

CHAPTER V.

The Riviera — Switzerland — Corsica — Malta — The Canaries and Madeira—Health Resorts and Springs - - - - 97

CHAPTER VI.

Belgium, Holland, Germany, and Austria, with their Health Resorts and Mineral Springs, and Prevailing Diseases - - 120

CHAPTER VII.

PAGE
The Climate of Spain—Portugal—Balearic Islands—The Azores—Italy—Sicily—Sardinia—Greece—Turkey—Cyprus—Russia—Roumania—Poland—Norway—Sweden—Denmark and Iceland, with their Health Resorts, Spas, and Prevailing Diseases - - 138

CHAPTER VIII.

Tropical Asia—Red Sea—Arabia—India—Ceylon—Hindoo-China: Their Salubrity, Prevailing Diseases, and Hill Sanitaria - - 158

CHAPTER IX.

Persia—Asia Minor, with Health Resorts—China—Japan—Central Asia and Siberia—Salubrity and Prevailing Diseases - - 183

CHAPTER X.

Africa—Its Different Countries and their Health Resorts - - 191

CHAPTER XI.

America, North and South—The West Indian Islands and Bermuda 213

CHAPTER XII.

Oceania, including Malasia or the Indian Archipelago—Melanesia, Polynesia and Australasia - - - - - - 239

CHAPTER XIII.

Sea Sickness, Sea Voyages, and Sea Bathing - - - 252

CHAPTER XIV.

The Climate of Central Africa as it affects Europeans, giving the Views of Surgeon Parke, D.C.L., late of Stanley's Expedition—South Central Africa—Management of African Fevers - - 261

THE BOOK OF CLIMATES.

CHAPTER I.

The Influence of the Sun—The Effects of Heat on the Functions of the Body—Effects of Heat in producing Active Disease—Secondary Causes of Climate, as Elevation of the Land, Influence of the Sea, Winds, Rainfall, Moisture, Configuration of the Surface, Soil, and Purity of the Air—Main Characteristics of Climates.

The Influence of the Sun.

Before proceeding to the discussion of the climates of individual countries and stations, it will be necessary to give a brief sketch of the leading characteristics of climate, and to say a few words on the subject of the acclimatization of the fair races of Northern Europe in hot countries.

The term 'climate,' from κλινω, I incline, was originally given to that portion of the earth's surface intervening between two lines running parallel to the equator, and indicated by the duration of the sun's appearance there during the summer solstice. The spaces between the equator and the poles, which were formerly divided into monthly or half-hourly climates (the latter indicating the increase of the length of the day as the tropics are approached), are now divided into ninety degrees, known as degrees of latitude. In the present acceptation of the term we understand the complete influences of the physical, geological, artificial, and atmospheric environment of a region, country, or place, or, according to Cabanis, 'L'ensemble

de toutes les circonstances naturelles et physique au milieu de quelles nous vivons dans chaque lieu.'

The sun is the source of heat, and if the earth were a level sphere, and the moisture equally distributed, would be the sole factor in the production of climate; and though this is not the case, and though powerful secondary causes, to be presently referred to, exercise considerable influence, still the sun is the main predominating agent, as exemplified by the difficulty of tropical plants and animals flourishing in temperate latitudes, and by the impossibility of the fair races of Northern Europe colonizing tropical lands.

The surface of the globe is divided into zones, one torrid, which lies between the tropics, and which with few exceptions corresponds to the isotherm 83° and 77° Fah. of temperature. The northern tropic, called 'Cancer,' is 23° 28′ north, and the southern, called 'Capricorn,' 23° 28′ south of the equator. The two temperate zones lie respectively between the northern and southern, and the Arctic and Antarctic circles, the Arctic being 23° 28′ from the north, and the Antarctic the same distance from the south pole. Beyond are the frigid zones. The temperate zones are generally subdivided into two regions, the line of division corresponding with the isothermic line of 59° Fah., or 15 Cent. All places situated between this line and the tropics, or, speaking more correctly, between it and 77 degrees of heat, are characterized by a subtropical or hot climate, in contradistinction to a tropical, intertropical, or torrid climate, appertaining to the torrid zone, and a cool climate, appertaining to the northern division of the temperate zone, in the northern hemisphere, and the southern, in the southern hemisphere. That portion of the intertropical zones extending for a few degrees on either side of the equator, and possessing great equability of climate, and the absence of any well-marked seasons, with almost daily rains, is known as the equatorial region. We may here remark that the inhabitants of the cooler temperate zone have been found to colonize successfully, not merely

commercially or as sojourning planters, but as tested by their power to work in the fields, many subtropical lands; but unless on the high plateaux of Mexico, and of Central and Southern America, they have been unable to form within the *tropics*, without racial admixture, permanent agricultural colonies; while as regards the natives of tropical regions and of those subtropical countries that border on the tropics, enervated as they are by the influence of a debilitating climate and a generous soil, they have always fallen an easy prey to the more vigorous, robust and inventive races of temperate Europe and America. The predominance of the Yankees, the Chilians, and Argentines in North and South America, and the successive conquests of the Indian Peninsula by northern hordes, and in later times by Portuguese, French and English, afford the best example of the justice of this opinion. That such should be the case furnishes the strongest evidence, not only of the deteriorating influence of tropical climates on the indigenous inhabitants, but of the impossibility of their permanent occupation and colonization by the races of temperate Europe. This is but a providential adjustment of the laws of nature, without which the races of torrid latitudes would in time become as extinct as the aborigines of the temperate portions of America, South Africa, and Australasia.

The degrading influence of heat is also well shown by the relative duration of life in the different climatic zones, taken from Michael Levi.

From the equator to the 20th deg. of lat. there is 1 death to 25 inhabitants; from 20th to 50th deg. of lat., 1 death to 35; from 40th to 60th deg. of lat., 1 death to 43; from 60th to 80th deg. of lat., 1 death to 50. In the north of France there is 1 death to 43-44; in the south, 1 in 40.

Isothermic Lines.—By reason of the inequalities of climates possessing the same degree of latitude, owing to the secondary influences which will presently be discussed, an attempt has been made to indicate places possessing the same *mean annual* temperature by imaginary lines passing through

them. These lines which are called isothermic, though indicating with sufficient accuracy the regions of equatorial, tropical, temperate, and polar vegetation, do not guarantee that places in the same isotherm possess an identical climate.

In some places the winters are warm and the summers cool, as in the British Islands and along the west coast of Norway; while in others, as Canada, Russia, North China, and the interior of large continents generally in temperate regions, the winters are extremely cold, and the summers remarkably hot. These conditions are denominated insular or equable, and continental or extreme climates, respectively. Isohymenal and isotheral lines, indicating a mean winter and summer climate, as well as others indicating a mean monthly climate, have also been described by Dove and others.

The principal causes which regulate the immediate action of the sun on the earth are:

1. *The distance from the equator.*
2. *The direction in which the sun's rays strike the earth.*
3. *The length of the day.*
4. *And the degree of refraction which the rays undergo in their passage through the air.*

The sun's rays, which falling vertically influence a part of the earth's surface equal to their own sectional area, are, when falling obliquely, spread over a surface which becomes larger in inverse proportion to the degree of obliquity. Thus less heat is secured from the sun by the same extent of surface as we proceed from the equator towards the poles. As regards refraction, it has been calculated that of every 10,000 rays, 8,123 perpendicular, 7,024 at an angle of 50°, and 2,821 at an angle of 5°, arrive at a given point.

The Action of Heat on the Air.

The air is heated by direct radiation from the sun, by terrestrial radiation, reflection, and conduction, and by currents. Direct radiation has but little effect on the higher

strata of the air, owing to its diathermatous nature, but on the lower, especially when loaded with vapour, considerable. Terrestrial radiation varies with the liquid or solid character of the surface of the earth. Of the heat not directly absorbed in its passage, a part is at once reflected into the air, the rest being absorbed, to be radiated later on. By direct conduction is understood the conduction from the hot earth of part of its heat to the strata of air immediately adjacent. Currents of heated and cool air rising and falling exercise considerable influence, as do also the winds.

The cooling influences are the radiation of heat into space, and the evaporation of liquids from the soil, water, and plants rendering sensible heat latent. Also when the earth has become cooler than the air, the latter parts with its heat by radiation and conduction (direct contact). The clouds also are cooling, by their shading influence.

The Effects of Heat on the Functions of the Body.

The effects of heat on the system differ according to the duration of residence. At first, particularly in the hot season, the functions of respiration and circulation are considerably increased, as is also the vital capacity of the lungs, the circulation being excited to a semi-febrile condition, and the temperature of the body sometimes heightened, at least for a time. After a sojourn ranging from six months to a couple of years, this state of exhilaration ceases, and the new-comer begins to approach somewhat the condition of the indigenized white man; and if he remain for a generation, to that of the native himself. The vital capacity and respiratory movements become lowered, the pulse loses in tension, the plumpness, rotundity, and firmness of the body diminish, and the excretions, as the urea and carbonic acid, decrease.

The action of the skin and liver are at first increased, but either diarrhœa or constipation may prevail. The process of digestion becomes more languid, particularly in moist hot

climates, and the appetite requires to be tickled and pampered. There are, however, many exceptions. There is prostration of bodily and nervous energy, and a lack of mental activity.

Blood Degeneration.

The effect of great and continuous heat on the blood may be considered the *fons et origo*, not only of most of the special diseases of tropical countries, but of that anæmia which few Europeans after a certain period of residence escape. The effects are as follows :—The blood is lighter in colour owing to the deficiency of carbonic acid, and to the more rapid flow in the vessels. There is deficiency of the number of red cells, and a deficiency of the quantity of albumen and fibrine. In cold countries there are $5\frac{1}{2}$ millions of red cells in a cubic millimetre, and in hot countries but three. This deficiency is mainly due to anoxyhæmia, or want of oxygen, which the rarefied, more moisture-laden and diluted air of the tropics produce ; supplemented, however, by the losses due to perspiration and biliary discharges, and by the difficulty of taking exercise without fatigue, probably still more injurious.

Owing to lessened sanguification, the result of the reduction of blood in the chest, and the accumulation of blood in the abdominal region and portal veins, and its pollution by retained biliary and kidney excretions, and the impairment of digestion, anæmia is set up. Hence the necessity for regular exercise, temperate living, change to temperate latitudes, and the avoidance of scurvy, syphilis, chlorosis, malaria, and other conditions which develop anæmia.

On the liver heat first produces hyperæmia, generally unattended with any derangement. This state is, however, materially increased by over eating and drinking, and the injection into the stomach of alcohol and other hot and irritating substances, as the blood then arrives in the liver with redoubled force, setting up temporary congestion, the

constant repetition of which is liable to set up dangerous disease.

Heat increases the sexual activity, but only for awhile. In dry hot countries this state may continue for a long period, but in moist and malarious localities, though the desire may remain, the vigour and power gradually decline.

Menstruation does not appear earlier among white children born in the tropics than at home. In healthy tropical countries fecundity does not appear to be diminished, and parturition is, at least for some years, easy and safe. Prolapse and displacement of the uterine organs are of frequent occurrence. In malarious regions abortions and premature deliveries are common, and sterility comes on apace. In Guienne the young Creoles are very unproductive, and widows when remarried rarely conceive. The milk is also deficient in quantity, and inferior in quality.

There is generally loss of weight in hot countries, but, while confined to the fatty molecules, this loss is not injurious; but if the muscular and nervous systems show signs of disintegration, then disease is at hand, and a change, especially if there is no marked cold season, is required.

Effects of High Temperature on Active Disease.

Sunstroke.—Owing to the action of the sun on the nerve-centres, or to the coagulation of albuminous fluids, a degree of heat above 130 is found to be fatal to vertebrate animals. Hence in very hot countries, where the shade temperature may rise 125° and the surface temperature much higher, death by sunstroke might be expected to be of frequent occurrence. Yet, owing to the protective influence of skin evaporation, conduction, and of sweat-drops, together with clothing, unless as the result of fatigue or intemperance, such is not the case. When, however, the perspiration is interfered with, as from the skin-parching effect of intense heat, sunstroke is greatly to be dreaded.

As regards other forms of tropical disease. Though con-

tinuous heat is their main predisposing cause, it is to the chilling effect of variations and oscillations of temperature, of heavy rains, of cold winds falling on a sleeping, heated, or perspiring body, and of inundations, marshes, and paludal emanations, that is to be attributed the main exciting cause of disease. Suitable clothing, and careful attention to the erection and site of the dwelling, to sanitary and individual precautions and management, will, however, in great measure enable us to prevail against the latter, while with the former we are almost powerless to contend. We may alleviate its attendant discomforts, and even, by exercise and attention to diet, etc., stave off its ultimate results; but eventually tropical anæmia, with or without a certain amount of acclimatization, with attendant racial deterioration, lays hold of the system, and the healthy European, or, at all events, his children, assumes many of the mental, moral, and physical traits of the half-caste, and even of the native himself.

Effect of a Low Temperature.

In conclusion, and by contrast, we will say a word as to the effect of low temperature on health and disease. A low temperature, owing to the action of cold air on the skin, and when respired, gives rise to loss of bodily heat, which can generally be prevented from becoming dangerous by suitable clothing, diet, and exercise.

Great cold is, however, unsuited to the very young, the aged, and the debilitated, and those with a bad circulation, particularly if combined with wind, damp, or fog. Cold, at all events dry cold, invigorates the healthy and those suffering from such functional disease as torpor of the liver and bowels, fulness of the veins and sluggish tissue-change. Sanguification is well performed, and the system stimulated to activity and vigour.

The Secondary Causes of Climate.

The secondary modifying causes of climate are as follows:

1. The elevation of the land.
2. The influence of the sea.
3. Winds, rainfall, storms, and moisture.
4. The nature of the soil, the general and local inclination of the place, the configuration of surface, vegetation, and cultivation.
5. The internal temperature of the earth.
6. The purity and electrical state of the air.

Elevation of the Land.

The influence of elevation of the land is only second to that of the sun, as measured in degrees of latitude from the equator, in its effect on the character of a climate, as it renders tolerable, and even agreeable, for Europeans many regions otherwise uninhabitable in the torrid zone itself. The line below which all snow melts in summer is known as the snow-line, the height of which line, though mainly regulated by the latitude and altitude, is yet considerably affected by the degree of exposure, the steepness of the mountain-slopes, and the rainfall. On the northern slope of the Himalayan mountains it is 4,000 feet lower than on the southern, owing to the heavy rainfall on the latter. Referring to lower levels than the snow-line, it has been calculated by balloon ascents that for every hundred yards of altitude the cold increases one degree, which is mainly due *to deficient terrestrial radiation, to the greater movement of the wind, and to the inferior capacity for heat of the drier and rarefied air.*

Causes modifying the Lowering of the Temperature on Hills.

For places on the earth's surface the same exactness does not hold good as that registered by balloon ascents. In the former, therefore, the fall of the temperature as we ascend is a variable quantity, and in some instances the temperature

is higher on the hillsides than in the valleys below, as it is also on the plateau on the mountain summit than in the region of cloud and mist lower down the declivity. It is also influenced: 1. By the configuration of the surface, being less on extensive plateaux, as terrestrial radiation is greater. 2. By the state of the air, the nature of the wind, as regards velocity, stillness, direction, the seasons, and the hour of the day. 3. By the aspect of the declivity and the nature of the soil, and the position with regard to continents, seas, marshes, and the nature of the vegetation. Mountain-slopes and projecting ridges are generally warmer than the valleys beneath and between. This is due to the rapid cooling, the acquired density, and the downward flowing of the air in contact with the hillsides, together with mists which arise from the valleys, by reason of which the latter not only retain their own cold of radiation, but also act as receptacles for that of the hills. Still, taking everything into account, the rate of decrease is pretty equally maintained.

Effects of Condensed and Rarefied Air on the System.

Before describing the effects of rarefied air on the system, we will, by way of comparison, draw attention to the influence of the opposite condition. Compressed air is said to increase the vital capacity of the lungs, to diminish the frequency of the respiration and pulse, to strengthen the latter, to increase the absorption of oxygen, the excretion of carbonic acid, and to excite the appetite. Miners, working under the pressure of two or three atmospheres, on returning to normal pressure, suffer from vertigo, earache, pain in the joints, nausea, and sensory and motor paralysis. These symptoms are generally transient; they may be fatal. As regards the effects of rarefied air, which effects are intimately connected with the greater purity, dryness, and higher electrical condition, we will give the experience of Weber, who took a party, some of whom were invalids, in

chairs, up the mountains of Switzerland. Up to 3,500, and from hill valleys up to 5,000 feet, all felt well, and their spirits and appetite increased. Ten out of fourteen felt thirsty, in all the pulse and the respiration were slightly increased, and all, even those suffering from heart and lung disease, could exercise their movements with a feeling of greater elasticity and force. When carried up to 8,500 feet the result was the same while rest was maintained, slight movements, however, increasing the pulse and respiration in some cases from 80 to 90 per cent. In one with mitral disease there was added vertigo and nausea, the result of cerebral anæmia. Healthy muscular movements were easier at 10,000, and those suffering from heart disease and consumption felt no discomfort while quiet. On attempting to walk up a slight incline they were attacked with dyspnœa, the heart patient passing into a fainting condition, from which a little wine brought him round, the nausea and sickness continuing till brought down to 8,000 feet. In the consumptive patient the pulse increased 20 per cent. while resting, and 65 while walking up a hill, with irregularity of rhythm in the latter case. The mountain sickness, as in the heart case, was absent, and but one healthy subject was attacked with nausea, diarrhœa, and vomiting. Shortness of breath occurred to all who took exercise. There was no bleeding from the mucous membranes.

As regards the effects of rarefied air in the tropics, I am able to speak from experience, having, in my capacity as civil surgeon to the district of Salem, in the Madras Presidency of India, made fortnightly sojourns of a few days to the station of Yercaud, in the Shevaroy hills. I have also sojourned at Ootacomond, elevation about 7,000 feet, and at Coonour, elevation 5,000 feet, on the Nilghiri hills. Yercaud is 3,877 feet above the town of Salem, at the foot of the hills.

During my excursions from one of these places to the other I was suffering from debility and occasional congestion of the liver, the result of a previous hepatic abscess,

and I frequently noted the effects of the ascents and descents on myself.

Ascending the mountains on horseback, generally in the early morning, there soon began to be felt a feeling of exhilaration of spirits, an ease of bodily movement, an increase of appetite, a cessation of perspiration, and often a desire to make water. The sensation on approaching the summit, and breathing the pure cool air, scented by the aroma of wild flowers, particularly when one caught a glimpse of burning plains below, was delightful, enjoyable, and invigorating beyond belief. To the exhausted European denizen of the plains the ascent of tropical mountains on a fine morning is a pleasure that cannot be described, and must be experienced to be realized.

As regards the effects on the pulse and respiration I noted that there was invariably a slight increase, but when taken the next morning before rising neither differed materially from their condition on the lowlands. Sleep was always more easily attained and infinitely better enjoyed than on the plains. I do not remember to have seen anyone who was unable to sleep on those hills, or any that suffered from giddiness, nausea, or headache. After a brief sojourn the appetite often somewhat declined, to be again increased for a time on descending to the plains.

Heart disease and hæmoptysis were not injuriously affected as long as the patients remained quiet, or only walked on the level, which is not easy of accomplishment in hilly districts. Asthma in the predisposed, particularly if connected with bronchitis, generally manifested itself; and some patients had to go down at once to get relief. Sleeplessness I did not observe at Yercaud, but it is common among excitable new-comers at Ootacomond, elevation 7,000 feet, and also in the Swiss Alps.

Effects of Hill Climates on Disease in India.

From an extensive series of statistics which I published in December, 1880, in the *Medical Press and Circular*, the following results were obtained:

Phthisis is less prevalent on the sub-tropical Himalayan hills than elsewhere in India, and infinitely less so than in the Punjaub and lower Ganges. It is also rarer on the southern hills than in the low country.

Enteric fever is less prevalent on the sub-Himalayas, but more so on the Madras and Bombay hills than in the low country. Heat apoplexy is infinitely less prevalent on the hills. Dysentery is slightly more frequent on the hills; but hepatitis much less so. Heart disease is of much more frequent occurrence on the southern hills; but in the Himalayan stations no difference exists.

Cholera is exceedingly rare on the hills. Malarial fevers are much less prevalent on the Madras and Bombay hills than elsewhere, but are more frequent on the Himalayan hills than in the low country of the Madras Presidency; but one-third less than in the Gangetic provinces, and infinitely less than in the Punjaub. Diarrhœa is slightly less prevalent on the hills; but respiratory diseases, excluding phthisis, much more so.

The military mortality from all causes is immensely lessened in the hill climates of India, being nearly as low as in England. On the plateau of Anahuac, the mortality of the French army, after five years' active service, was less than that of the troops stationed in Paris; while those at Vera Cruz, on the sea-board, suffered terribly. Altitudes from 5,000 to 8,000 feet, according to latitude, are the best in the tropics. Very high altitudes are often disagreeably cold, and the air is so raw that exercise may be disagreeable. The wet, misty, and cloudy slopes of hills should, however, be avoided.

Curative Effects on Disease.—It is as a restorative to those suffering from overwork, or exhausted by the heat of the plains, that tropical hill-stations are the most advantageous. Convalescents from acute disease, if no grave organic lesions remain, will do well in the hills. Cases recovering from, or threatened with, hepatic abscess, when their choice lies between removal to Europe in the winter or spring, would

have a better chance if sent during the cold season to the less elevated and drier hills, for it is amongst those who return home during the cold weather and the cutting east winds that hepatic congestion, suppuration, and congestive pneumonia almost entirely occur.

Consumption complicated with bowel disease does badly in the tropics. Advanced cases during the hot season in the tropics would probably, from the greater coolness of the air, derive much benefit on the hills. Hæmoptysis, if quiet is maintained, may sometimes be relieved, and perspiration and expectoration almost invariably so. Very high situations are not advisable. Those convalescent from an attack of acute dysentery whose system is lowered, dyspeptics or those with functional visceral derangement, and the weakly and debilitated, will derive benefit from change to the hills. Chronic dysentery, chronic hepatitis, chronic intermittent fever, chronic or severe cardiac or respiratory disease, will probably be rendered worse by change to the hills. Sufferers from syphilitic cachexia and rheumatism had better remain on the plains. It is right to observe that some authorities recommend *very high* and dry elevations as most suitable for rheumatism, gout, and neuralgia. Leprosy, as I have pointed out in the *Medical Press and Circular* in the year 1887, would probably derive great benefit from the pure, dry, and invigorating air of the hills. Leprosies should be set on the hill-stations, and not, as at present, located in such damp situations as Port Blair, Malabar coast, or the island of Molokai.

In the tropics mountain climates are especially useful to delicate women and children, and the latter, if obliged to go to the tropics, should, if possible, go there at once. Nervous depression and irritability from slight touches of the sun, or overwork, leucorrhœa, uterine weakness, leading to premature confinements and puerperal mania, are benefited on the hills. Sufferers from intractable skin diseases, as the Burmese ringworm or boils, will on the hills be placed in the best position to get rid of their troubles. Dr. Oertel, in his

work on 'Respiratory Therapeutics,' advises strengthening the action of the heart by systematic consecutive exercise on mountain ground and climbing. He indicates as suitable for the purpose mountain valleys surrounded by hills rising to 3,000 feet above the valley, and divides the walks into four classes:

1. Level walks over undulating ground.
2. Walks with some little climbing.
3. Ascent of steep heights.
4. From steep to difficult mountain work.

All walks should rest short of fatigue.

This he calls the 'terrain-curort,' and it is said to be curative in many cases of heart disease. I would, however, advise considerable caution to those who may be disposed to give it a trial, and I should not recommend its trial at very high elevations, or in cases subject to hæmoptysis, where grave valvular lesions exist, or in the low tropics.

Yellow Fever, unknown in the East, does not in tropical America extend much beyond the Tierras Calientes. In Mexico it has never reached Orizaba, elevation 3,645 feet, but it has ascended to over 4,000 feet in Jamaica.

Permanent Effects of High Elevation on the Acclimatization of Tropical Countries.

Colonization of Hills.—The first and only real variety of acclimatization is that which enables the white races of Europe to enjoy health and increase in numbers, as they do in Canada, the United States, and Australasia. This is tested by their power to work in the fields and on the farm. The second is that which enables Europeans to enjoy health while engaged as overseers or in the operation of tea or coffee planting, but not entailing manual labour in the sun. The third is that which enables them to enjoy health in the occupations of missionary, functionary, or merchant, with

certain precautions, not entailing any continued unprotected exposure to solar influence.

As regards the two latter varieties of acclimatization there can, I think, be no doubt but that the natives of temperate Europe can attain them at tropical elevations above 4,000 feet.

As regards the first degree of acclimatization, or what I may call the acclimatization of colonization, opinions are divided.

As regards the plateau of Anahuac, which may be considered the most favourable region of the tropical zone, Jourdanet, who lived long in Mexico, considered the rarefied air, by inducing slow deoxygenation of the blood, 'anoxyæmia of altitudes,' an obstacle to the racial acclimatization of Europeans in this region. Jules Rochard holds a different opinion, and states that the plateau of Anahuac is highly salubrious to new comers and old residents alike. Coindet states that the French army recovered rapidly from the diseases contracted in the low country. Excepting affections incident to war it suffered nothing, and left the country in an admirable sanitary condition. The number of births greatly exceeds the deaths, and that the population does not greatly increase is due, not to the climate, but rather to its deplorable political condition. While admitting the political condition and its evil effects, it cannot be denied that the population is essentially a mixed population, in which the pure or mixed descendants of the indigenous races, after more than three centuries of Spanish domination, continue in increasing numbers to predominate. It is the same throughout the highlands of Central and Southern America. The natives and mixed breeds have recovered their ground, and that in spite of considerable immigration from Europe, the favoured position of the dominant race, and the long continued drain on the Indians in working the mines. In Peru, out of a population of 3,000,000, there are only 200,000 whites; the proportion, however, is much greater in Mexico.

In the Argentine and Chilian republics alone do the white races bid fair to push out the Indian, as they have done and are doing in other temperate lands. Nevertheless, it cannot be denied that the Spaniards have met with considerable success in colonizing the upland regions of tropical America. That the natives and half-breeds still predominate, and are likely to continue to do so, is true. This, however, is due not entirely to the influence of climate, and it must be remembered that in those regions alone, on the broad American continent, did the white man on landing find powerful and populous communities.

That the Englishman then is not so well adapted to the colonization of mountainous tropics as the Spaniard, Portuguese, or Italian, all will admit. That the temperate climate of altitude will always fall short of and can never entirely supply the place of the temperate climate as indicated by degrees of latitude, cannot be denied; for, however invigorating it may be, the powerful sun, the rarefied air, and the absence of marked seasonable influence, will eventually tend to anæmia and racial deterioration. With these reservations we are justified in stating that on elevations varying from 6,000 to 10,000 feet, if properly cleared and selected, Europeans of all countries can enjoy good health, and enjoy it with comfort, at all events for many generations, and bring up their families in increasing numbers, but with greater difficulty than at home.

That the race will deteriorate there can, however, be no doubt. Judging from my own experience in both hemispheres, I wish it to be clearly understood that I can never recommend tropical altitudes, however salubrious, as countries of selection for the labouring emigrants of Northern or Central Europe.

Mountain Climates in Temperate Latitudes.

In countries at a distance from the sea, a summer sojourn on mountains of moderate elevation has long been recommended. For the young and the vigorous, if only below par

or worn out by mental or bodily fatigue, and such convalescents as are capable of taking exercise and enjoying the invigorating but variable weather, they are decidedly beneficial. Children and elderly people and those needing rest and repose are, however, better and safer by the sea, on shipboard, or in the low country. Even the middle-aged citizen should be carefully warned that active exercise, such as climbing up and down hills, may be attended with danger, either fatal and sudden, or remote, by laying the foundation of cardiac or a vascular disease. In Switzerland, Austria, and the South of France, places of an elevation of 2,000 feet with a south aspect are genial and tonic, while above 4,000 feet they are generally exciting, and often wet, variable, disagreeable and harsh.

Influence of Elevation on Consumption in Winter.—Owing to the more rapid passage of blood through the lungs, which on mountains, as in hot countries, occurs among new-comers, as the result of the rarefied air, and thus rouses into vitality diseased or disused patches of lung, and to the influence of the pure, dry cold, sheltered, and bracing air, many favoured mountain valleys in Southern Europe have been recommended with advantage as a winter residence in certain well-selected cases of consumption. To derive benefit from a winter sojourn at Davos Platz or similar winter resorts, the power of taking exercise should remain almost entirely unimpaired, for on mountains, as in the tropics, the rarefied air renders exercise the first desideratum. Hence there should be a fair amount of vigour, and no complication either cardiac, vascular, or bronchitico-asthmal that may interfere with a patient's freedom of movement. There should be no local disease beyond a limited consolidation or cavity, and no laryngeal neurotic or bowel complication, neither should there be any great tendency to intercurrent inflammatory attacks or to hæmorrhage. Young people with threatened consumption or in the early stage of the torpid variety do best. If some relief is not early experienced, a prolonged residence is not advisable. Certain

symptoms, such as I have before alluded to, may be felt on arrival at mountain resorts. They are, however, of little consequence, and soon pass away.

The Effects of the Neighbourhood of the Sea.

The influence of the sea is only second to that of elevation of the land in modifying the climate of a place. It is owing to the immense preponderance of water over land that the average temperature of the southern hemisphere is three degrees lower than the northern, that the climate of high seas is so cool and equable, that sailors diseased and languishing in tropical ports recover their health almost immediately on putting to sea, that small tropical islands approaching in character to the climate of high seas are generally healthy, and that if situated in the high tropics they are often capable of European colonization, as New Caledonia, or Tahiti. In hot climates the maritime regions are never so warm as the interior of the country at the same level, while in cold countries the reverse is the case. In cold countries also the warmth of the coast is often increased by warm currents like the Gulf Stream, to which influence is in a great measure due the warmth and equability of the British Islands, the West Coasts of Norway, France, and Portugal. Cold currents also exist and lower the temperature of hot regions. The effect, then, of the sea is to equalize the temperature, to increase it in the cold regions in winter, and lower it in the hot. The main characteristic of a marine climate is that of equability, the seasonal difference and that between the day and night being less than on inland situations. The air is dense and the pressure high, with considerable and regular fluctuations, while the relative humidity is generally great.

On small islands the equability approaches that of the high seas, and the climate in the tropics, owing to the rarity of cold and the absence of dry, hot, and often dusty and pestiferous land winds, is far more pure than on continents.

The absence of cold winds depends mainly on the level character of the land, for wherever the surface is mountainous, with narrow valleys and gorges leading down to the coast stations, particularly when situated at the main alluvial outfall of the island, dysentery, hepatitis, and other affections due to alternations of temperature, are apt to be present; but when the islands are comparatively level and possess a soil capable of easy natural drainage those diseases are much less frequent.

All marine climates are also cooler than other places at the same level, in consequence of the local wind, owing to the unequal heating of the land by day and night, while the greater prevalence of vapour helps also to veil the rays of the sun. Narrow peninsulas and promontories are remarkably cool and equable.

Having often noticed the breezy and exhilarating effect of a walk on the end of the pier at Madras in comparison with that along shore, I would recommend to the enterprising the advisability of setting up hotels on the pier ends of such places as Madras or Colombo. An additional advantage would be the freedom from human pollutions, so common yet so offensive to the olfactory senses in tropical towns.

The air of the high seas is also free from germs and the sources of malaria, and is rich in bromine, iodine, and saline materials, while as regards health-giving ozone it is *facile princeps*.

Water in relation to Temperature.—Water is heated more slowly, and gives off heat more slowly, than land. It also retains it longer. The loss by radiation is less than on land, and the air over it is moister and more equable than elsewhere. The specific heat of water is five times that of earth; water cooled at the surface sinks, allowing a lower and lighter stratum to come to the top, hence the adjacent air is not cooled at night as on land. According to Captain Thompson, the difference of the night and day temperature off the coast of Scotland is only 6°, while on land it

is 12°. Fresh-water freezes at the top at 39°, sea-water at 32°. It has, I believe, generally been asserted that the air over water invariably contains more moisture than that over land. This statement is, I think, unsupported by facts, which, on the contrary, tend to show that while the air over the sea is never so dry as that over land, neither is it ever so moist. I have myself made about twenty voyages in both hemispheres, and my experience is that within certain limits the amount depends on the state of the atmosphere as regards the power of the sun, clouds, and the character of the winds. Moreover, I can safely say, I have never at sea found anything approaching the humidity of Lower Burma during the wet season. I admit that my experience has been confined to steamers, every part of which is perhaps influenced by the fires of the engine-room and galleys. I have, however, been informed by men engaged in sailing vessels that they have often slept on deck in fair weather, and that in the Channel, without any injury whatever resulting. A certain amount of moisture was sometimes experienced, but it caused no inconvenience among healthy men, and was never dreaded unless when approaching land, more particularly on the weather bow.

Marine Sanitaria in the Tropics.—Such places are not well suited for invigorating Europeans debilitated by the climate. They are, however, valuable in inflammatory, abdominal, or chest affections, as hepatitis, dysentery, and malarial fevers. Marine stations should be situated either on small islands, or promontories jutting well into the sea, and far removed from marshes, rivers, and alluvial soil. They are not suited to phthisis, but in sub-tropical countries they are found beneficial, at least in winter, in this disease.

Marine Sanitaria in Europe.—The drier and more bracing seaside stations are best for the scrofulous, convalescents from acute disease and surgical affections, sufferers from mental or bodily fatigue, consumption, if the inflammatory element does not predominate, and generally for all persons

between puberty and old age. Such stations may be found along the English coast—from Redcar to Weymouth—the east coast in summer, and the south in winter and spring. The Riviera is well suited for those complaints in winter, and is probably the best place, taking it all round, for every phase of consumption when removal from home is advisable. Large cities, with a mixture of broad, glary boulevards, and narrow streets where the sun never shines, should be avoided. Chronic bronchitis, pneumonia, pleurisy, irritable throat affections, and inflammatory consumption, require a soft, mild atmosphere. The purely hemorrhagic variety, however, longs for a still but bracing air.

Chronic rheumatism, arthrites, gonorrhœal rheumatism, chronic syphilis, as well as heart disease and asthma, are best suited in a dry, warm, but sheltered situation.

Those who easily catch cold, and growing children subject to winter bronchitis, are almost certain to become vigorous at school by the sea.

The air of the more exposed stations on the east coast of England and the west and south coasts of Ireland will often be found too stimulating and windy for young children suffering from diarrhœa and non-assimilation of food, and exhibiting a tendency to mental excitement, or meningitis, and for young girls and other delicate people subject to cardiac trouble. These, as well as the rheumatic, are better a little way inland, not too far to be out of reach of the organic and invigorating influence of the sea air, but sufficiently remote to escape the nauseating and languid effects of its saline ingredients and the turbulence of its occasional eccentricities.

Such semi-marine stations are Queenstown and Rosstrevor in Ireland, and Southend, on the Thames estuary, which I believe to be one of the best places in England for very young children. There is that happy conjunction of the sea air and that of the country which suits them so well. Abroad we have Hyères and Amélie-les-Bains, as well as

certain places near the north-west coast of France, which possess a good, mild, permanent climate.

The dyspeptic, the bilious, the eczematous, and sometimes the gouty, generally do badly by the sea, and especially the two former, if the air is relaxing.

Winds.—Wind may be defined as the movement of the air, resulting from the difference of temperature in different places. The air being rendered specifically lighter by the addition of watery vapour, rises, and that which is of greater density flows in to supply its place. Winds give rise to barometric disturbance, and the transmission of miasma, dust, and specific germs of disease, and by their higher currents blowing in an opposite direction to the lower, are the source of many varied meteorological conditions.

In their effects on health the winds have to be considered with reference to their velocity or stillness, their temperature, and the amount of dust or aqueous vapour they carry. The greater their velocity, the more chilling and forcible their effect. Even hot winds, if dry, generally cool by promoting evaporation, while if moist they have but little effect on the temperature.

The Rainfall.—The rainfall depends on the prevailing winds, as regards their direction, temperature, moisture, velocity, and electric state. Clouds deposit their contents, owing either to influence of cold, or as the result of concussion or compression. Hence it is that the rainfall is heaviest on the slopes of mountains, for it is here that a hot and moist air first comes in contact with a cool one. Next to mountains the rainfall is heaviest near the sea. The amount of rainfall decreases from the equator to the poles; while as regards the number of rainy days, at least till near the equator, the reverse is the case. In the tropics the rains are periodical, and the summer is the rainy season; while most rain falls in winter in subtropical regions and in South Europe. In temperate regions the rains are constant, but in West Europe the heaviest fall is in autumn, when the warm sea winds first meet the earth, which at this season is beginning to grow

cool. The rainfall on slopes of hills increases with height, up to great elevations; but at elevations above 10,000 feet it is generally slight, snow often supplying its place. The so-called rainless region, corresponding to the greatest heat on the globe, owing to the trade-winds blowing constantly towards the sea, comprises in the northern hemisphere the Sahara and other desert regions, and in the southern hemisphere the Kalahari Desert, in South Africa, and that of Atacama, in America.

Moisture.—The principal source of moisture is the rainfall, but rainy regions may be fairly dry as regards the state of the air, owing to the heat of the sun, the small number of wet days, and the porous nature of the soil; and on mountains, owing to the inferior capacity of the air for moisture.

On the other hand, the absence of rain is sometimes compatible with considerable atmospheric humidity, owing to the lack of cold-condensing currents. Under such conditions fogs and dews supply to some extent the want of rain.

The amount of moisture is represented by the degree of humidity, which is described as *absolute* and *relative*. The relative humidity is most important from a climatic point of view. It represents the ratio between the amount of humidity in a given quantity of air, and the amount the air can carry without rain (its saturation); and must be considered in connection with the temperature, the density of air, and its evaporating power, which is much greater at 90° Fah. than at 60°. It decreases as we ascend mountains, is generally abundant on sea, and increases from the poles to the equator, and is heaviest of all in the tropics during the wet season.

Effects of Moisture on Health and Disease.

Moisture lessens evaporation from the skin and lungs, and if the air is still, may help indirectly to increase its temperature, owing to its power of absorbing heat. If not accompanied with wind or rain, moist hot climates are more

oppressive than the combination of heat and dryness. If the former conditions prevail, and the sky is overcast, the feeling, even in very hot countries, is that of a damp, creeping coolness, which is sometimes the harbinger of fever. Dry air is everywhere more bracing; moist air more soothing, enervating, and more frequently attended with loss of appetite, depression of spirits, and disorders of the kidneys, stomach, and bowels.

Polyuria and diarrhœa sometimes in hot countries follow a sudden increase of moisture. They are not injurious, for without their occurrence pulmonary or intestinal hæmorrhage may crop up instead, owing to the heightened liquidity of the blood. Excessive moisture also contributes to the development of consumption, elephantiasis, leprosy, and infantile paralytic affections. Sunstroke, on the other hand, is prevented by a moisture-laden atmosphere; for although the body-cooling is less than when the air is dry, there is generally less need for evaporation, owing to the equalizing and cooling effect of the moistened air, and to the removal of heat by conduction. Malarial and yellow fevers are also more frequent in damp places. Storms are felt most near the mountains and the seashore. At the change of the season they are most appalling in the tropics, and sometimes dangerous to delicate people. Atmospheric electricity exercises considerable influence on the organism, but we are not justified in forming any definite conclusion as to its effects from our present imperfect knowledge.

Configuration of the Surface of the Land, Soil, Vegetation, and Cultivation.

Plains are subject to great difference in temperature between night and day, and plateaux to extremes of heat and moisture, but isolated, flat-topped hills and hilly districts are more equable and variable.

Mountain ranges exercise a remarkable influence on the climate, particularly having regard to the cardinal points.

Thus the windward and rainy side of mountains is often deluged with rain, while the country beyond is dry and protected. Winds in passing over the summit blow in a slanting direction down the leeward side, becoming drier and more heated as they descend. This descending air is called the windfall, and that between it and the leeward side of the mountain surface the wind shade (Dove). The distance at which the windfall reaches the ground averages about seventy times the height of the range over which the wind has passed (Dove).

The climate of valleys is influenced by the character of the inlets and outlets, the breadth, the height, the slope, and vegetation of the hills, the amount of sunshine they enjoy, and the protection afforded from cold or hot winds. In broad valleys the heat during the day may be intense, owing to reflection from the mountain sides, while the nights are cool, owing to rapid radiation, and to the effect of cool currents from the hills. Narrow valleys are more equable, but are apt to be damp, misty, and devoid of sunshine.

Soil.—The geological formation exercises a marked influence on the temperature and salubrity of a place. In the tropics it will be generally found that in places of moderate elevation, the soil is composed of volcanic débris, covered with humus. This soil is very healthy. In hot climates a sandy soil is perhaps of all the most disagreeable, sand being not only easily heated, but retains heat longer than any soil, 220 degrees of temperature being sometimes registered.

It is, however, remarkably free from fevers, owing to its dryness.

As compared with other soils, the heat-absorbing power of sand is great, the proportions being as follows : calcareous and sabulous, 100; sand, 95; light argillaceous, 73·2; gypsum, 71; compact argillaceous, 68; earthy argillaceous, 66·7.

Sand retains moisture badly. Sand superimposed on a layer of rock or hard argil will act as a filter, the moisture

remaining at a lower level. Dry clay absorbs its own weight of water, mould more than half, sand about one-third only. Sand gives it up quickest, then mould, then clay.

Of other soils, ferruginous varieties heat and cool quickly; alluvium, and alluvium covering argillaceous lime and sand, are remarkably insalubrious; granitic, metamorphic, trap, oolite limestone, chalk, and sandstone are healthy; clay and marl, or sand with clay beneath, are damp; magnesian limestone is fairly healthy. Blackish soils, easily absorbing heat and parting with it, are, in hot countries, on account of their coolness, the most agreeable.

Vegetation.—The effect of cultivation and moderate afforestation is generally to greatly improve the climate of a place and to render it more equable. The temperature of the soil of forests is about 20 per cent. lower than outside, and the mean annual temperature of the air 10 per cent. lower. The day temperature is also lower, that of the night higher. The relative humidity is increased from 3 to 10 per cent. The rainfall is also increased, but with this there are some exceptions, as shown by the effect of the deforestation of the small island Lebuan, which was to increase materially the watery precipitation. The writer of the colonial report in which I found this statement, whose name I regret I cannot remember, does not attempt any explanation of this very exceptional result. It is, in my opinion, due to the flatness of the island, and the same result would probably follow the cutting down of forests in all similar divisions of land.

Owing to their size, small islands of level character offer no obstruction to winds which blow over them, the rainfall being similar to that of the surrounding seas; while forests, on the contrary, by offering a certain obstruction, would cause an increased precipitation all round the coasts, and less in the interior, and this is in conformity with the effect of forests on land, which is to increase the precipitation of rain in the country surrounding them. In hot countries, situations near forests, unless associated with great damp-

ness, always allowing for free circulation of air, and healthy park-like lands, from which all undergrowth has been removed, afford an agreeable shade, and are well suited for settlement and the erection of dwellings.

Grass and Marsh-land.—The air over grass-land is cooler and moister than over barren or sandy soil; while that of marshes is not only colder and damper than in other situations, but is generally saturated night and morning with mist and fog. Marsh air is the main source of paludal fevers.

Drainage slightly raises the temperature of the soil of arable and pasture-land; and drained land is less feverish, owing, to some extent, to the temperature being less subject to fluctuations.

Selection of Sites.—The inclination is twofold, general and local, but they may be opposed to each other. In hot countries the best situation is on a slope looking from the sun, N.N.E. in the northern, and S.S.E. in the southern hemisphere. In cold countries the southern or western is the preferable aspect, and the north-eastern is the coldest of all. For encampments, punch-bowls, enclosed valleys, ravines, and nullahs should be avoided.

The hot day current flows up the ravine, the cold, dangerous, perhaps impure, night one down it. The outlets of contracted narrow valleys with wet ground pent up behind are especially to be avoided.

Hollows should also be avoided, as, even if pebbly or sandy, they may become damp; the water rising owing to pressure from higher levels. Proximity to bare rocks is bad; cut-away banks and sharp hillsides are also bad.

Sites along running streams are not injurious, nor places close to tidal inundations; but marshes subject to annual overflow are to be avoided.

In cold countries vegetation renders the ground cold and moist; but in hot countries, as it shades the ground and renders it cooler, trees sufficient for shade should be allowed to remain, unless when they materially interfere with the movement of the air.

Brushwood should always be removed round a permanent dwelling, but not round a camp, as its removal has been known to increase fever for a time (Parkes).

The work of removal should be done in the morning and evening.

The experience of China shows that highly cultivated land is not unhealthy; but my advice is not to bring children in China into too close proximity with gardens reeking with the odour of human manure.

In selecting permanent sites for townships, it is well to fix on some place that a temporary occupation has shown to be good; but for temporary occupation or a permanent residence it is, above all, necessary to be near a good water supply, which should always be examined and tested. The banks of rivers are good if there are no marshes, which should always be avoided; as should also the snug little places where gorges lead down to the river. See that there is sufficient slope for drainage, and that no drainage flows on to the site. Avoid old encampments, dwellings, or ground that has been much disturbed. Before building, the site should be carefully drained both on the surface and deeply.

The house should be constructed on such sanitary principles as will insure dryness of all its parts, perfect ventilation, purity of the air, provision for the removal of excreta and water, and in the tropics it should be raised some feet above the ground, have ample verandas for shade, and, if possible, some part of it should have a flat roof, which forms in the evening a pleasant resort for conversation and exercise.

The internal temperature of the earth, unless directly under the sun, and if the rain is equally distributed, is the same as the air. The diurnal variations penetrate to three feet and the annual to forty.

Purity of the Air, and Malaria.

The air is pure in proportion to the amount of oxygen and ozone it contains, and impure in proportion to the quantity of carbonic acid, and floating animal and vegetable and specific disease particles which pollute it. The air of towns and crowded localities and dwellings, particularly in hot countries, is most impure, that of the open country, and especially of the seaside and mountains, and above all of the high seas, the most pure. Dirt, filth, overcrowding, defective ventilation, and sewage will vitiate the purest air, whether on the mountain summit or the ocean wave.

Malaria.—Those who believe in the malarial etiology of paroxysmal fevers, include malaria amongst those agents which affect the purity of the air. But whether these fevers be due to paludal or telluric emanations, or to chill, or, as I believe, to both, all the directions for their prevention tend to increase the dryness of the climate, and thus lessen the sources of chill; or by clothing, brandy, port, or quinine, and the avoidance of fatigue, to prevent its operation. Hence, whatever theory we may feel disposed to accept is of secondary importance, for the preventive directions of all may be safely accepted by everybody. Paroxysmal fever has now its specific malarial bacillus.

The Main Characteristic of Different Climates.

The *equatorial climate* is characterized by great equability, almost daily rains, cloudy skies, great heat, and only one well-marked season. Europeans cannot become acclimatized, even as merchants or functionaries, as anæmia comes on apace. And the mountain resorts, unless very high and dry, afford no adequate change owing to the absence of seasons, the heavy rains, and the excessive atmospheric rarefaction from the combined effect of heat and elevation.

In the *tropical region* extending from the equatorial to the 23° lat., the hot and cold seasons become gradually

more marked, till towards the tropics the summer heat is intense and the winter cold perceptible and restorative. Here the dry hot season is in spring, the wet in summer, and the cold in autumn and winter. There is also sometimes a short rainy season in October. Both regions are characterized by the number of marshes, jungles, inundations, and great unhealthiness, especially for Europeans and new-comers. Some, however, are rendered additionally insalubrious by the presence of paludal fevers, from which the drier ones are comparatively free. These fevers are the result of the combined influence of chill and of marsh and other telluric emanations. The severer forms, called remittents, and indeed also the intermittents, are not unfrequently influenced by the nature of the soil and the local conditions, which give the disease a certain peculiarity, till gradually we arrive at the specific epidemic affections, as the typhoid of subtropical countries, the typhus of Ireland, and the yellow fever of Central America.

In the dry hot season, particularly in dryish climates, the heat before the rains is often intolerable, yet it is perhaps the healthiest time of the year. It is the season of sunstroke, nervous affections, ardent fevers with liver and brain complication, miscarriage, of the plethoric and prickly heat. In the wet season the type of fever is passive, with abdominal and lung complication. Dysentery is frequent at the onset and end of the rains, and abortions in the debilitated occur. The cold season, so pleasant to new-comers, is often very trying to old residents and young children. Anorexia and abdominal distension, sometimes followed by dropsies, paralysis, œdema, and fevers, are apt to occur, and dysentery with piles, and congestion or suppuration of the liver, spleen, and kidneys, are not unfrequent.

Other diseases of hot climates are cholera, diarrhœa, leprosy, elephantiasis, ulcers, intestinal worms, dengue, berberi, scurvy, rheumatism, small-pox, and the convulsive and digestive disorders of childhood.

Subtropical Climates.—In this division the mean annual

temperature is 18° lower than in the torrid zone. The variations are greater, and all the meteorological phenomena less uniform. The summer still predominates, yet there is a distinct winter, and the spring and autumn begin to make themselves felt. When near the tropics these regions are often burning deserts subject to intense summer heat and all the diseases of the torrid zone; but when well drained and cultivated, and lying towards the temperate regions, they are generally healthy. Congestions and suppuration of the liver, and dysentery are common, but paludal fevers, though rife, are not very fatal or severe.

Temperate Climates.—A temperate climate is characterized by its great mobility as compared with the uniformity of the polar and tropical divisions. The oscillations are frequent, and the mean annual oscillations vary from 41° to 69° Fah. They vary greatly with the locality. The daily variations are also frequent but limited, and all the seasons are distinct and nearly of equal duration. The spring and autumn, though agreeable, are the most unhealthy and most subject to climatic disturbance. The winds are variable. The south-west ones predominate in Europe, and the north-west in the southern hemisphere. The rains, though less abundant and regular than in the tropics, are far more frequent and continuous. The mortality, and particularly the infant mortality, is lower, and the longevity and intellectual and physical standard higher than elsewhere. The prevailing diseases are those of the respiratory system, including pulmonary consumption.

Cold climates, which represent the polar extremity of the great temperate zone, are characterized by a short, brilliant and luxuriant summer, and by a winter with snow on the ground from October till June. The diurnal range, owing to the long duration of the summer sunny days, and to the almost entire absence of sun in the winter, is remarkably slight, and contributes materially, in spite of the wintry mists and fogs, to that comparative freedom from consumption and chest affections which cold climates enjoy.

Cold climates, if the clothing is warm, are, perhaps, the healthiest of all. Intermittent and typhoid fevers and hepatitis are almost unknown; and though dysentery occurs, it is as the result of hardship and unsuitable food. The most common diseases are hydatids, principally of the liver, which afflict one-seventh of the people of Iceland, eruptive fevers, tetanus of the newborn, spedalskhed, a somewhat similar disease which carries off 50 per cent. of the fish-eating children; fatal epidemic influenza, catarrhal spring fever, whooping cough, rheumatism, frostbite, hysteria and itch.

Although consumption and chronic chest affections are rare, these climates cannot be recommended to sufferers from these affections. On the contrary, strangers thus afflicted, particularly if they have a weak circulation, rapidly get worse.

Polar Climates and the Land of the Midnight Sun.

These regions are divided into the coast and inland ice districts, and are covered with glaciers. The climate is extremely cold, as the Arctic summer begins in July and ends in August. During this period the sun remains continually above the horizon.

Rain, sleet and snow occupy the spring and autumn, but at this time the ice, unless far north, is not strong enough for sledging.

In addition to the intense cold, sudden changes are of frequent occurrence, summer sunshine giving place to fogs, mists and snow. The mean temperature of South Greenland is 33°, while that of January at Rensellen is – 65°. At Upperwick the highest maximum is 59°, the mean of summer 58°, and of winter – 7°. Snow falls to the depth of 20 feet; but there is no rain in winter. The mirage parhelia and auroral displays are often observed.

The climate is not unhealthy. Ross, in his voyage, lost but 3 out of 25 men—one from phthisis, and one from pleurisy. Of the 300 accompanying Franklin only 8 died. The most common diseases are frostbite, scurvy, dysentery,

and ophthalmia. There are two varieties of ophthalmia—one, a retinal congestion from the glare of the snow the aurora and the horizontal sun; and the other, a general conjunctivitis, the result of wind, the introduction of snow into the eyes, and the congelation of tears. Dysentery is the result of hardship among Europeans, and of gluttony alternating with abstinence in the natives. The natives suffer from phthisis, pyrosis, itch, and other skin diseases, and are a short-lived race.

Therapeutical Division of Climates.

Climates are therapeutically divided: first, according to the suitability for a prolonged or temporary residence, as permanent and seasonal; second, according to the situation, into mountain, maritime, ocean, semi-marine, and inland or extreme; third, according to their effect on the system, into bracing, relaxing, exciting and sedative.

CHAPTER II.

Mineral Waters—Baths—Whey, Grape, and other Cures, and Massage.

Mineral Waters.

As I purpose to add to the climate of individual countries a short account of their principal mineral springs, it will be necessary to say a few explanatory words on the subject of mineral waters in general.

Mineral waters differ from ordinary drinking waters in containing such an amount of solid constituents as to render them unsuited for daily consumption, or when this is not the case, their temperature at the source is higher than what is usual in the same locality.

Numerous chemical substances, either free or in combination, have been discovered in mineral waters. They are generally derived from the strata through which the waters pass, and the principal are common salt, sulphate of soda or Glauber-salt, sulphate of magnesia or Epsom-salt; carbonate of soda, of magnesia, of lime, and of iron, sulphide of sodium and lime, bromine, iodine, carbonic acid, hydrosulphuric acid, nitrogen and oxygen. There is sometimes also the slimy substance called glairine or baregene, which is a low organic compound formed at the bottom of the wells, and which adds to the softness of the water.

The cause of the high temperature of the hot springs is supposed to be due to the high internal temperature of the earth. The degree of heat, which is generally far below the boiling point, has been constant for ages, and the only

springs whose temperature reaches 212° are the Geysers of Iceland, Bishisht in India, and Ischia.

Division of Mineral Springs.—Mineral waters may be conveniently divided as follows:

1, Indifferent; 2, earthy; 3, alkaline; 4, sulphurous; 5, purgative; 6, chalybeate; 7, saline; 8, iodo-bromated and muriate of lithia; 9, miscellaneous, sand, peat, mud, pine baths, and inhalations; 10, dry, whey, grape, and milk cures; 11, electricity and massage.

Another division is into hot and cold springs, the former having a temperature above 75°, the latter below; the former of more general utility for bathing, the latter for drinking. At most springs, however, both bathing and drinking are now carried out; and in laryngeal and bronchial affections gum, whey, or milk is mixed with the water.

Action of Mineral Waters.—It has been clearly shown that a great portion of the water and salts and gases are absorbed in the stomach. Of those, nitrogen and cold hydrosulphuric acid have a soothing effect; while if the waters are hot the latter is exciting. Carbonic acid in moderate quantities adds to the palatability of the waters, and stimulates the action of the stomach and intestines. At the same time it soothes the irritable stomach, and is always refreshing.

As regards absorption by the skin, the report of Grandeau showed: 1. That as the skin is not in contact with the water owing to sebaceous secretion, it cannot absorb. 2. That any substance to be absorbed must be miscible with the sebaceous secretion, and thus are fine powders absorbed. The probability, however, is that when the skin is clean, as under the prolonged effect of soft water, some slight absorption occurs.

Carbonic acid is absorbed in the bath, as shown by the speedy reaction and warmth. Alkaline, ferruginous, and saline substances are not absorbed, and the effect of such baths is due to their temperature and the carbonic acid they contain.

These as well as the sulphur waters do good by stimulating the peripheral nervous system, and improving the functions of the skin, the appetite, and the powers of assimilation. Much of the good, however, arising from a course at the baths is due to the rest, the quiet, the altered conditions of life, the pure country air, and the invigorating alpine or sub-alpine, and for us islanders the extreme, climate of many of these thermal resorts.

Still, as I know from personal experience, very much can be done by the skilful application, not only of mineral, but of ordinary waters, towards the relief and cure of disease. In spite of enthusiasm which should not be hastily condemned, and of considerable exaggeration which here, as in other departments of medicine, is always to be regretted, there can be no question but that the mineral springs are becoming increasingly popular, and there is no doubt that when limited to suitable forms of disease in suitable climates and seasons they are deservedly so.

Mineral waters are, as a rule, only beneficial in chronic or threatened disease where no active structural lesions exist. They are especially well adapted for persons of middle-age, the young and the very old deriving but little advantage. The diseases most frequently benefited are chronic, gouty, and rheumatic conditions, with their resulting stiffenings, thickenings, and want of mobility; old sprains, chronic skin, hepatic and intestinal affections; portal and abdominal plethora, the malarial anæmia of returned tropicals; chronic bronchial and laryngeal diseases, struma, scrofula, and syphilis, sciatica; renal and uterine disorders, sterility depending on curable metritis and leucorrhœa, diabetes, lithæmia, obstinate constipation, old ulcers and sinuous tracts, threatened tubercular disease, chronic paralysis, especially when the active cause has subsided, as after diphtheria or fever, lead-poisoning, hypochondriasis, hysteria, and old spinal disease. The waters, especially the baths, are injurious when a tendency to internal hemorrhage or apoplexy exists. The baths are

also contra-indicated in developed tuberculosis, diseases of the heart and great vessels; aneurism, cancer and fatty degeneration. They are generally useless in locomotor ataxy, confirmed paraplegia, and in hemiplegia, when the brain is structurally diseased. The season varies with the climate, but is generally from the 1st of May to the end of September; but in hilly districts, particularly in England, owing to the wet and the cold, September is often exceedingly disagreeable. The best time is from the 1st of June to the 1st of September. Some Continental stations are fearfully hot in midsummer, and those in Italy and Spain are, as a rule, too hot for the English. Some stations are open all the year round, but unless when the case cannot be delayed, and where the climate and conditions of life are specially favourable, as at Bath, Baden-Baden, or Amélie-les-Bains, the season should be confined to summer. The course varies from three to six weeks, and the duration of the bath is from a quarter of an hour to an hour. The drinking is carried out daily, and the bathing either daily or less frequently as desired. At first the dose should be small—two or three glasses before breakfast, and about half that amount in the evening. The dose, which should be neither too hot nor too cold, should be sipped gradually while walking up and down, and breakfast, if the health will permit, not taken for an hour after the task is completed. The breakfast should be light, and at the early dinner fruit and salads should not be used; wine and beer are permitted. Supper takes place at eight, and the bedtime is ten p.m. As it is advisable to combine with the bathing advantages a pure air, beautiful rural scenery, and a certain amount of gaiety and amusement, large towns and very dull places should generally be avoided.

Indifferent Waters.—Indifferent waters are so-called because of their low mineralization, so low that when drunk the effect is hardly different from ordinary water. They are generally thermal, and they act like an ordinary warm bath on the skin. At a temperature of 96°, they excite the peri-

pheral nerves and circulation, free the breathing, and increase the urinary and cutaneous secretions. They absorb exudations and increase the appetite, and are sometimes very exciting. The milder ones calm the nerves, and are useful in hysteria, dysmenorrhœa, spinal irritability and sterility, gouty and rheumatic neuralgia, inflammation of tendon-sheaths, and exudations, either rheumatic or result of injury. Tic-douloureux and sciatica are the most difficult to cure. Loss of power, if electrical contractibility remain, is often relieved, and it is well to use an electrical course before and after the baths, which should be decidedly hot. In diphtheritic typhoid, post-partem, and lead paralysis the cure is hastened, and the results of shocks or blows, as after railway accidents, are often removed. Paralysis following effusion of blood on the brain, if the brain itself is not diseased, and time be given for absorptive hemorrhage, may derive great good; spinal paralysis of rheumatic type is also relieved. Gouty deposits and affections of joints are benefited by hot baths, douches, and massage.

Earthy Springs.—These differ from the indifferent ones in their more powerful mineralization, but their action as baths is the same, though their operation when taken internally is different. The earthy salts are sulphate of lime, carbonate of lime and of magnesia, and a little sulphate of alumina. These waters are useful as antacids in dyspepsia, but their reputation is based on their efficacy in bladder diseases. They are also said to be useful in scrofula and tuberculosis. They are generally thermal.

Alkaline Waters.—Alkaline waters contain large quantities of soda carbonate, and carbonic acid, with some potash and a little lithia. They are useful in dyspepsia, particularly in the dyspepsia of returned tropicals; in relaxed condition of the throat; in hepatic enlargement or chronic congestion, where the purgative waters are unsuitable in gall stones; in early diabetes, in lithiasis (largely diluted), in the more active types of gout, by contributing to the absorption of fat; and in catarrhal mucous discharges, by lessening and

thickening them. The thermal ones are very beneficial in chronic bronchial colds, and in early phthisis associated with acidity of the stomach. Freely applied they are useful in vaginal and uterine discharges in the more robust.

Alkaline table waters are useful in digestive and urinary disorders, and when charged with carbonic to the extent of ten inches to the pint they are stimulating and agreeable to the taste.

Sulphurous Waters.—Sulphurous waters are those which have either a sulphurous odour or deposit sulphur; they are really alkaline waters with a little hydrosulphuric acid or sulphur. There are two divisions, viz., those containing sulphur and soda, and those containing sulphur and lime. The first are generally warm, the latter generally cold. The colder ones contain also common salt and sulphate of soda, and the warm ones the baregene from the bottom of the wells. The Pyreneean waters also contain silicates, to which a special benefit is attributed.

Simple sulphur waters are rather binding, but owing to the presence of other salts they are occasionally laxative. They increase the urinary secretion, and after prolonged use set up anæmia, and lessen hepatic enlargements. When too long continued, a loathing and a catarrhal affection of the throat is apt to arise. They are used internally to aid the operation of baths, in the hemorrhoidal diathesis, diminishing abdominal plethora and local hemorrhoidal congestion, in malarial cachexia, hepatic and splenic enlargements, in incipient tuberculosis, in chronic cutaneous affections, in developing eruptions, in latent syphilis when aided with mercurial inunction and iodide of potash. They are also beneficial in uterine disorders.

Sulphur waters give off hydrosulphuric acid, nitrogen and carbonic acid, and these gases are to some extent inhaled even when no special inhalation rooms are provided. The waters are also pulverized and inhaled, and used as gargles, and are thus beneficial in laryngeal and bronchial affections, owing as well to the sulphur as to the effects of the moist

warm air. The baths at a temperature of 90° to 95° stimulate the skin, lighten the breathing, and increase the urinary secretion.

Purgative Waters.—These are of two kinds, the strong and the weak. The former are largely exported and used as aperient medicines, and contain considerable quantities both of sulphate of magnesia and sulphate of soda; the latter are much milder, and contain a much smaller amount of purgative salts, principally sulphate of soda or Glauber-salt, with a good deal of carbonate of soda and common salt. For continued use the sulphate of soda can with impunity be much longer continued than sulphate of magnesia, which in large doses is said to affect injuriously the muscular system. The stronger purgative waters, in the order of their relative strength, are as follows: Franz Joseph, Hunyadi Ofen, Pullna, Birmerstorf, and Saidschutz. These contain no common salt, which is, however, largely present in the waters of Friedrichshall, Kissingen, Uriage, and Leamington.

Leamington is remarkably rich in common salt, comparatively so in sulphate of soda, and poor in sulphate of magnesia. Neither Leamington, Cheltenham, Saidschutz or Birmerstorf contain any carbonic acid. Therefore, the most palatable would be Hunyadi, Pullna and Friedrichshall, while one of the strongest, safest, and most effectual is the Spanish Rubinat-Condal, its solids being principally of sulphate of soda. The waters of the second class are milder, viz., those which contain no sulphate of magnesia, and are Karlsbad, Bertrich, Marienbad, Franzensbad, Elster, Fured, Rohitsch, and St. Gervais.

Chalybeate Springs.—Iron steadies the pulse and heart, increases the heat of the body, braces the system, contracts the capillaries, cures chronic coughs and genital discharges, and is especially useful in anæmic, debilitated, and chronic malarial conditions. Many anæmic and chlorotic people being subject to habitual constipation are unable to take iron alone, when it may be advantageously combined with

a saline laxative medicine, which both helps its absorption and prevents the headache which sometimes follow its use. In such states the waters of Homburg, Franzensbad, and Elster are infinitely preferable to simple chalybeates. The cure requires the absorption of about forty grains of metallic iron, and should be prolonged to four or five weeks.

Other diseases cured or relieved are chronic diarrhœa, neuralgia, sexual debility, impotency, sterility, hyperæsthesia, catarrh, weakness and spasms of the bladder, and, generally, conditions associated with the formation of stone. Iron is contra-indicated in the excitable, full-blooded, and plethoric, especially if there is any predisposition to hemorrhage; and it is of little value, and may be injurious, to old people.

In mineral springs iron generally exists as the carbonate, rarely as the sulphate or chloride; and it is almost invariably associated with other salts, while there is generally a large amount of carbonic acid, which improves the flavour. Iron waters are divided into the acidulous chalybeates, saline acidulous chalybeates, and alkaline chalybeates.

Besides the carbonated waters, there are the sulphated waters—too strong for internal use. The sulphated waters are very disagreeable to the stomach, and, though not adapted for drinking, have a tonic and astringent effect on the skin. They are thus used at Trefrew in North Wales; while those of Levico, which contain arsenic, are used subcutaneously in skin diseases.

Saline Waters.—Besides chloride of sodium, or common salt, salt water contains chloride of magnesia, and chloride and carbonate of lime. Chloride of lime is said to be useful in scrofula, and in preventing the formation and causing absorption of puriform matter. Salt increases the corpuscles, and lessens the amount of water in the blood.

Such waters must be used internally with some care, as anorexia, bilious diarrhœa, and fever may result. Those which contain much carbonic acid are the most palatable, but unsuited to the apoplectic or plethoric.

The seaside is the place for the scrofulous, and salt

waters exercise their best influence on this disease. Next, they are especially useful in tropical anæmia and in the anæmia of females. In these conditions they aid the absorption of iron, the use of which should always follow up the course of salines, or, better still, waters containing iron and salines; the latter in such proportion as not to cause purging, as at Kronthal and Homburg, should be used. In the tropical cachexia, following diarrhœa, dysentery, and liver congestion, salt waters are sometimes, but not always, beneficial. They are most useful also in chronic liver and splenic enlargements, and in relaxation and imperfect development of the uterine system. 'There is no doubt,' says Dr. McPherson, 'that chronic congestion and hypertrophies of the uterus are often removed and its functions restored by the internal use of salt water judiciously employed.'

Chronic ophthalmia in feeble women is often relieved by salt and ferruginous waters. Salt-water baths are also much in use in Germany, and in other countries removed from the sea. They produce cutaneous stimulation, ranging according to the strength, which varies from 3 to 10 per cent. of salines.

Warm salt baths are beneficial in convalescence from acute disease, also in chronic rheumatism and gout.

Iodo-Bromated, Lithia, and Arsenical Waters.—Though the presence of iodine, bromine, lithia, and arsenic is held out as a special inducement by the managers of springs, it is probable. owing to the exceedingly minute quantities in which they exist, to the association of large quantities of common salt and other solids, and to the absence of any physiological effect, that their virtues are greatly exaggerated.

We have now described briefly the different mineral waters, and we have only to add that, for those who are unable to drink them at the source, they have been bottled and exported. Of alkaline and saline waters, Vichy Vals, Bilin, Karlsbad, Marienbad, Fachingen, and many others, are within the reach of all. Iron waters do not keep well; while, as regards the other waters, the stronger the

mineralization the better they keep on exportation. Many of the weak table waters are pleasant and refreshing, and though some may possess no more medicinal virtue than ordinary water, still they are deserving of support, particularly wherever there is any suspicion of the local potable water. The stronger of these waters should at first be used in small doses, and gradually increased.

Mud, Peat, Pine, Whey, Sand, Carbonic Acid, and Electrical Baths.

Mud Baths consist of the sticky soil round the baths through which the waters emerge. This is collected generally in one large bath, and if not naturally hot enough is artificially raised to the required temperature. There are mud baths at St. Amand, Strathpeffer, Acquï, and Abano. They are useful in rheumatic complaints.

Peat Baths.—These are made of the peat or turf-earth which is exposed to the weather during winter, and is then impregnated with the mineral waters of the locality. The temperature is 95°, and the bath is about as thick as pea-soup. These baths, though dirty, are very agreeable. They are very exciting, stimulating the action of the skin, and causing, if unduly prolonged, much irritation. They also stimulate the nervous and circulatory activity, and they encourage tissue metamorphosis.

They are used locally as poultices, and these applications are often very beneficial.

They are generally used alternately with the mineral bath, than which they are much more resolvent.

Peat baths have been especially recommended in spinal irritation, hysteria, anæmia, and hepatic and splenic congestions. They should *not* be used if there is any eruption, or in heart disease, or where there is a tendency to cerebral disturbance, or in phthisis.

Pine-Balsam Baths consist of the addition to the water of the bath of from one to twenty or more pints of the balsam

distilled from the fresh green leaves of the pine. The temperature of the bath is from 80° to 100°, which produces stimulation and pricking of the skin. This balsam is also used as a vapour bath. These baths are beneficial in chronic rheumatism, neuralgia, sciatica, etc.

Baths impregnated with scented herbs, as thyme, lavender, etc., and baths of whey, to calm the nervous system and allay cutaneous irritability, are to be had in Switzerland and other places where milk is plentiful.

Gas Baths, both natural and artificial, are also obtainable. In the former the gas as it escapes from volcanic rocks is utilized, as at Solfatara, San Germano, and Cronsac. The gases are sulphurous, carbonic, and ammoniacal.

The artificial gas baths are to be had at those springs where carbonic and hydrosulphuric acids are abundant. The patient is generally seated enclosed in a box with the exception of his head. When the gas is let in, it displaces the air, gives rise to a sense of heat and perspiration, and stimulates the pulse and the organs of generation. These baths last about twenty minutes, and are useful in paralytic and rheumatic complaints, and locally in painful affections of the womb. Chlorine gas is also used as a cutaneous stimulant. These baths require a certain amount of care, and their virtues are often exaggerated.

Electrical Baths are also very popular, and are useful when electricity is advisable.

Sand Baths, also called arenation, consist in the practice of covering the body with sand, and exposing it to the sun on the sea-beach, after which shower baths are used. Sand-baths are principally used in rheumatic and gouty disease.

Besides these the scum of the hot mineral baths, the brine from the salines, the yellowish matter from the sulphurous and iron baths, and the baregene, at Barèges and other places, as containing the essence of the bath contents, are highly commended.

Another feature of bath life is the spray and inhalation

of the vapours of the waters, and gargles and douches of the waters themselves.

Common salt inhalations are presented by allowing the waters to trickle through hedges, on the lee side of which the patient is directed to rest and inhale. Saline air is also presented by pulverization in inhaling chambers at many salt-springs, where ten grains of salt are calculated to be inhaled per hour. They are used in chronic catarrhal laryngitis and bronchitis.

Sulphur, in the shape of hydrosulphuric acid, is inhaled at the principal sulphur-baths. It favours excretion, perspiration, digestion, and appetite, and helps to calm the nervous and vascular systems, and, when blended with nitrogen and carburetted-hydrogen, is very useful in chest, throat, and phthisical affections.

Nitrogen gas is highly recommended by Drs. Robertson of Buxton, and Smith of Leamington, as an aerial diluent in pulmonary complaints. Pine inhalations, mixed with the vapour of water, are also of great utility in throat and bronchial disorders.

Massage and electro-massage are now most skilfully employed at most of the baths both at home and abroad, and are useful for those who are unable to take exercise, for chronic loss of power, cutaneous hyperæsthesia, obstinate constipation, constriction of the gullet, hysterical loss of voice, sleeplessness, weak circulation, chronic enlargement of the liver; those paralytic conditions suited to baths, as infantile paralysis; the removal of effusions, dropsies and thickenings; neurasthenia, amenorrhœa and certain faulty states of the ovaries; various uterine prolapses and disorders, and other affections of hypochondriacal females. In uterine and ovarian tumours massage can only have a palliative effect. Massage, and especially the electro-massage, should not be used in recent paralytic disorders, or where central lesions are still in existence.

The diet cures are:

1. The dry diet plan.

2. The grape cure.
3. The milk cure.
4. The whey cure.
5. The koumiss cure.

The dry diet cure consists in living mainly on bread and biscuits, with wine, and little water, and the very smallest amount of meat. Here the water and solid constituents are lost. The temperature may at first rise to 104° and the body weight decrease, but only so long as the plan is adhered to. Associated with hydropathic treatment and abstinence it is called Schrot's cure, and is said to be effectual not only in obesity but most other diseases. It may also be associated with Oertel's 'terrain-curort,' or graduated climbing.

The grape cure consists in the regular use of large quantities of grapes, as a systematic cure of disease. In Switzerland there are two kinds of grapes used, viz., the Fendants, richer in gum and albumen, and the non-Fendants, richer in grape-sugar and acids.

Besides the constituents mentioned, grapes contain iron, potash, soda, lime, magnesia, with tartaric and malic acids. When taken at first grapes generally cause purging, and, if they agree, this becomes frequent and regular. They also increase the appetite, the circulation, the action of the liver and kidneys; and they may even set up epistaxis and hemoptysis. They are fattening.

The grape cure has been beneficially employed in early phthisis of the erethic type, in dyspepsia, hepatic congestion, jaundice, piles, and in bronchial catarrh; and, if ripe and used with care, they may be tried in chronic tropical diarrhœa. The dose per diem varies from three to six pounds, divided into a quarter before breakfast, half between breakfast and dinner, and a quarter in the evening. The grapes should be ripe, and neither the skins nor the stones should be swallowed; but the grapes, and not the expressed juice, must be used. The course is about a month. It may set up ulcers about the mouth, injure the teeth, and upset

the liver. It is best adapted for men, and least for children. The season is in September. Milk should not be used with the grape cure.

Milk Cure.—Of all food milk is most quickly digested. It is alike fattening and nourishing, but unless it is hot it is not stimulating. It is slightly constipating. The whey, which contains the salt, sugar, and water of the milk, is a very light and grateful drink to the feverish, being at once diaphoretic, laxative, diuretic, and stimulating to the liver.

In long-standing cases of perverted nutrition and dysentery, when other drugs fail, the systematic use of milk is of the greatest advantage. A small tumblerful should be given tepid three times a day, and increased to three or four for some time, when the small dose should again be taken up. Stale bread-and-milk soup may sometimes with caution also be allowed.

Milk diet is useful in hepatic dropsy, dyspepsia, congested liver, neuralgia of the bowels, chronic diarrhœa, dysentery, hysteria, hypochondriasis, anæmia, early tuberculosis, scrofula, and rickets. In consumption, two litres per diem should be given between meals.

In Switzerland the goat-milk whey is considered best in chest affections, cow's for abdominal complaints, and sheep's where nutrition is deficient. Whey has been used in consumption of erethic type, in hemoptysis, bronchial and laryngeal catarrh, and in congestion of the liver and piles. The whey cure, to be really effectual in such diseases as phthisis, should be prolonged at intervals from the spring, through the summer, into autumn. Koumiss is also to be had at many baths.

CHAPTER III.

The Climate of England, Scotland, and Ireland—Health Resorts and Mineral Springs—The Channel Islands.

THE CLIMATE OF ENGLAND.

The eastern counties of England are uniformly flat, rising into undulating ground in centre and south, and ascending to hills and mountains in Wales, the western and northern counties, and Derbyshire.

The mountains form an irregular chain of low elevation with numerous outliers on both sides, from the Cheviot Hills in Northumberland to Land's End in Cornwall. In this course the chain passes through Cumberland and Westmoreland, where Skiddaw and Scawfell attain an eminence of 3,022 and 3,208 feet respectively; and on, at low elevation, between York and Lancashire, to the Peak in Derbyshire. Of low elevation in Cheshire, the chain descends through Wales, from Denbigh to Carmarthen, where, in the Snowdon range, it rises to 3,571 feet.

Leaving the broad, elevated, and extensive Welsh chain, and going due south from Derbyshire through Stafford, we have the mountains of Warwick, the Cotswold Hills in Gloucestershire, the Mendip and other hills in Somerset, and the broad table and forest lands of Devon, whose average elevation is 1,500 feet. From Dartmoor the ridge gradually sinks to 850 feet at Carnwath, and 60 at Land's End.

The climate is extremely uncertain and variable, especially towards the west; but the changes, though sudden, are so limited, that there is seldom much difference between the

day and night temperature. Snow seldom lies long on the ground, and the ice is rarely strong enough for skating. Along the south-western and western coast regions and in Wales the winters are generally damp, genial, and mild; while the summers, though dampish, are perhaps the coolest in England, owing to the westerly winds from the ocean.

During the prevalence of easterly winds, from February till May or June, the east and south-east coasts are the coldest parts of the country; while the east side, a little way inland, is always the driest, and as a permanent residence for most people the most invigorating. The hilly districts of the interior are variable and damp, and parts of Cumberland are said to have the heaviest rainfall in Europe. In autumn and early winter the most favoured parts are the coasts of Sussex and Kent, and during the spring Hampshire, the Isle of Wight, Devon, Cornwall, and Wales. There are also many places in the interior well adapted as permanent places of residence for invalids, amongst which I may mention Bath, Cheltenham, Tunbridge Wells, Norwood, and other sheltered places in Surrey.

London.—London is said to be the healthiest city in Europe, owing in a great measure to the high degree of perfection attained in its sanitary arrangements. The soil is clay, loam and gravel, resting on chalk. The mean annual temperature is 50°, that of the winter 38°, and of the summer 63°. The rainfall is 21 inches, falling in 180 days. As the nights are warmer than in the neighbouring districts, invalids are sometimes better in London in the winter than in the country. The great drawbacks at this season are the thick, harsh, penetrating fogs, which injuriously affect the strongest lungs, and the depressing influence caused by the prolonged absence of sunshine.

During the late spring, summer, and early autumn the parks are beautiful, and London becomes a very pleasant place of residence, wanting in August, however, the freshness of the seaside or country. The most healthy suburb is

Hampstead, so well suited to little people, and to all but the most excitable convalescents.

Kensington, Brompton, Chelsea, Fulham, and Battersea have a milder air than other parts, and are best suited to many delicate poitrinaires, while others requiring bracing should select Marylebone, Tyburnia, Bayswater or Highbury. The soil of Kensington, Bayswater and Marylebone is generally gravel or sand, while that of Kilburn and the district of St. John's Wood is mostly clay, and apt to be damp.

The districts round the Crystal Palace are beautifully wooded, and charming in summer. The north-eastern side of the Central Hill at Norwood has a cold, bracing aspect and a clayey soil, while the southern declivity—Anerley, Croydon—is sheltered, and possesses a sandy soil, and is milder, drier, and better adapted for delicate people, and those who have long resided in tropical climates.

The district between the Edgware and the Tottenham roads is said to be the healthiest in London. The banks of the Thames between London and Gravesend are not desirable places of residence, and the Essex marshes still retain the aguish and rheumatic reputation given them by Dickens in 'Great Expectations.'

Seaside Resorts.

These are divisible: first, into those on the east coast, characterized by a dry and bracing air; second, into those on the south coast, from Dover to Weymouth, characterized by a warm, fairly dry, and somewhat bracing climate; and third, into those on the south-west and west coasts, characterized, with exceptions, by great dampness, mildness, equability, a large number of wet or drizzly days and a cool and breezy summer. The sea is warmer on the south and west than on the east coast, and therefore generally proves more pleasant for bathing.

Proceeding southwards along the east coast, the first station is *Redcar*, near Middlesborough, with fine sands and good bathing accommodation.

Saltburn, further south, has fine sands, and is noted for its pleasant situation, its bold cliffs, breezy walks, and sheltered gardens.

Whitby is a more pretentious, interesting and amusing resort than Saltburn or Redcar. It also possesses good bathing, pure water, and a pleasant back country. The visitors mostly reside on the West Cliff.

Scarborough is five and a half hours from London, and has been called the Brighton of the North. As a seaside health-giving place, its fine position on a high promontory is unique, rendering its climate at once bracing, invigorating and equable. It is a well-frequented, fashionable, lively place; has a good sandy beach, and a mild chalybeate and saline spa. The mean temperature of the last six months of the year is 50° 6′, as against 42° for the first. Like almost every other place, it has been recommended to consumptives in winter. I cannot, however, join in this advice.

Filey is a quiet place, with good bathing and a bracing climate. It is built high above the sea, and has much to recommend it to families.

Hunstanton, on the mouth of the Wash, has a good sandy beach and a bracing climate. It is a dull place.

Cromer is on the Norfolk shore, and has of late become a fashionable place. It possesses a fine esplanade, a high location, a bracing air, good sandy bathing ground, and pleasant back country. Great Yarmouth, also in Norfolk, is a fine blustery place, with a good sandy beach and bracing air. Though well frequented, it is not as fashionable as Lowestoft, its quieter neighbour. Lowestoft possesses a harbour, a fine pier, and a good beach.

Felixstowe (Suffolk) may be described as the Eastern Bournemouth, being held in great local repute not only as a summer, but also as a winter resort for poitrinaires. Having a southern aspect, and being well protected by cliffs to the north, it has a very sunny warm climate till the east winds begin to prevail in spring. The bathing is good,

and the hotel accommodation excellent. It is two and a half hours from London.

Harwich, with *Dovercourt*, has a sandy beach and good bathing, as have also the Essex towns of Walton-on-the-Naze and Clacton, which are accessible by both steam and rail from London.

Southend, on the Thames estuary, is within an hour of London, and is a capital place for very young children. Here, as in most other places, the high ground should be chosen, and old houses, close to the sea, avoided.

South of the Thames, in the Isle of Thanet, is Margate, with its satellites, Herne Bay, Birchington, and Westgate-on-Sea. *Margate* is held in deserved repute as one of our most bracing and convenient resorts. It has a north-easterly aspect, and therefore, contrary to what appertains on the south coast, the north-easterly spring winds are sea instead of land borne. It has fine sands, a very extensive sea frontage, a chalky subsoil, and a pure and plentiful water supply.

The safest and healthiest part is Cliftonville. It is a fine dry place in autumn, and is especially well suited to the scrofulous. Weakly and delicate children speedily become strong and robust if sent here to school. It is equally beneficial for healing old ulcers and in convalescence after surgical operations. It is unsuitable for the excitable, and those afflicted with consumption or cardiac troubles.

Herne Bay has a similar aspect and climate to Margate. Birchington lies between Herne Bay and Margate, and is located on high ground about three miles from the latter. It is a quiet but windy place. *Westgate-on-Sea* is more fashionable, and many wealthy people have marine residences here. There is good bathing, pure and bracing air, a public garden, and a fine sea drive. It lies high.

Broadstairs lies in a quiet little bay between Ramsgate and Margate. Though small, it is a pretty, healthful place, and is well suited to quiet families and children of the better class.

Ramsgate, unlike Margate, is somewhat protected from the north and north-east winds; still it is a fine bracing summer place, lying mostly on the east and west cliffs, high above the sea. It enjoys splendid sands and safe bathing (on the east side only), and the London and Chatham line runs right on to the beach. There is a very good harbour between the cliffs. Of these, the west cliff, away from the crush of the strand, is the most fashionable, while the east is not only convenient for bathers, but possesses the celebrated Granville Hotel. Comparing Broadstairs, Ramsgate, and Margate in the height of the summer, Broadstairs is rural, quiet, and aristocratic, Margate is devoted to youth, beauty, and pleasure, and Ramsgate principally to cockney families and children. Ramsgate, however, becomes fashionable in September and October. Pegwell Bay is a quiet little place close to Ramsgate. Deal is a clean, quiet, cheap little town. It has, however, a shelving, stony, narrow beach, and cannot be recommended to ladies and children. At Walmer Castle, near Deal, the Duke of Wellington died.

Dover.—Dr. Yeo describes Dover as very cold in January, very windy in March, very hot in July, but pleasant in May and June, and from August to the end of September. The same author says it is suited to early phthisis, bronchial catarrh in the young, with sensitive nervous system and a languid circulation; in dyspepsia, with loss of appetite and depression of spirits; irritability of temper, chronic diarrhœa from residence in hot climates, insomnia, and scrofula. Dover is fairly protected from the north, north-east, and north-west winds. The soil is porous, being sand upon chalk. The water supply is good. The early winter is mild, with strong sea breezes.

Folkestone has two climates: that of the sheltered beach, which is sometimes hot and close, and that of the bracing and more exposed Lees and West Cliff. It possesses extensive walks, and great facilities for riding and driving. The water is pure and plentiful, and the drainage is good. It is said to be the driest town on the coast, and is picturesquely

situated, mostly on high ground. Owing to the port and the military, there is always a good deal of movement. The beach is, however, stony, but there is a bathing establishment, with a tepid swimming-bath. Scrofula, scrofulous bronchitis, some kinds of asthma, irritability, insomnia, and hypochondriasis are relieved. Many people prefer Folkestone to any place on the coast in summer.

Sandgate is close to Folkestone, and possesses good bathing and a sandy beach, and is protected by hills from the north winds. It is a quiet, agreeable place, with a good sea walk and a pleasant back country. The climate is like the lower part of Folkestone. A marine walk connects it with Hythe, which is a similar place in every respect.

Hastings and St. Leonards.—This resort is in winter one of the most agreeable and, for many invalids, useful places in England, and especially so for a prolonged sojourn, as one escapes that feeling of dulness and ennui which seems to pervade the atmosphere of Ventnor and Bournemouth. It is fairly well protected from the north and north-east winds, but very imperfectly from the east, the best sheltered positions being on the Marina west of the archway and some parts of Hastings away from the sea. As compared, say, with Ramsgate or Folkestone, this station principally lies low by the sea, the sea frontage occupying several miles, and along its course there are many sheltered resting-places where the invalid may enjoy the warmth and sunshine.

The main-drainage is good, but the house-drainage is not always above suspicion, and in the older parts of the town cesspools may still be found. The mortality is, however, remarkably low (16 per 1,000).

During winter and spring, Hastings and St. Leonards may be considered a fairly dry and sunny place, and fogs are remarkably rare. The mean winter temperature is 40°, that of spring 44°, summer 60°, and autumn 53°. The rainfall is about 28 inches, but owing to the prevalence of south-westerly winds, which are rarely high, the number of wet days is 216 as against 159 at Ramsgate.

The soil is a greensand, overlying clay, a soil which extends from Beachy Head to the border of Kent. Owing, therefore, to this soil, and to the absence of any occupied cliffs by the sea, the climate is no doubt relaxing, and with some people conducive to biliousness. It is, however, less so on the higher ground away from the front.

Bexhill, a few miles from St. Leonards, is a quiet village, with a mild winter and good snmmer climate.

Eastbourne has a south-eastern aspect, with a level sea frontage, and is laid out in three parallel promenades at different elevations. There is a good sandy beach, excellent bathing, and many shelters for invalids. Good concerts, lawn tennis, cold and warm swimming-baths, are to be had at the Devonshire Park. The high promontory of Beachy Head, with its invigorating and bracing downs, the good sanitary state, and the backward extension of the town, which gives ample choice of a residence, must not be forgotten. Eastbourne affords a good residence for those requiring a bracing air for the last four months of the year. It is well suited to scrofula, hydrocephalus, tabes mesenterica, and functional diseases of the heart and nervous system (Broadbent). It is a good place for consumption in summer, and at all times for digestive or nervous depression, particularly a little away from the sea.

Between Eastbourne and Brighton is Seaford, which is sheltered from the east winds by Beachy Head.

Brighton is most remarkable for its fine bracing and healthy situation on chalk, away from streams, sandy marshes, or other dampish lowlands. The east cliff, called Kemp Town, is the most invigorating. Hove, and the western side, though damper, lower, and somewhat protected, is the more fashionable quarter. The Old Steyne is intermediate between, and the King's Road is fully exposed to the effects of the sea. Autumn and early winter is the favoured season, for then Brighton is relatively much warmer than the interior, and the wind blows fresh from the open sea. From February till the end of May keen and highly irritating

east and north-east winds are apt to prevail, while in summer westerly breezes are common.

There is a sandy beach and good bathing. Seaside hepatic dyspepsia sometimes occurs, when the cure is removal to an inland situation. The climate is useful in the following states, viz., anæmia, hypochondriasis, nervous depression, some forms of kidney disease, struma, and slow convalescence from acute disease and surgical operations.

The air is generally restorative and tonic, and an autumn sojourn lessens the tendency to catch cold during the ensuing winter and spring. It is a bad place for the plethoric, the irritable, and those subject to inflammatory or cutaneous diseases.

Worthing lies west of Brighton, and has a similar climate, and, like Brighton, it is protected by the downs to the north. It is therefore warm in winter till the east winds in February, and in summer the air is cool, being neither too bracing nor relaxing.

There is good sea-bathing on a sandy beach, and a fine sea frontage. It is a good place for sufferers from heart, chest, and kidney diseases, rheumatism, whooping-cough, and scrofula. It is rather a quiet place, but has advanced rapidly of late.

Littlehampton, sixteen miles west from Worthing, possesses fine sands, and a mild pure air; it is well suited to families in summer.

Bognor is thirty miles west of Brighton, is protected by downs from the north winds, and possesses a fine sandy beach. The climate is mild and salubrious and the bathing excellent. The surrounding country is beautiful. The water is generally obtained from wells.

Hayling Island, reached *viâ* Havant, is a salubrious quiet place with good bathing, a sandy beach, and a sea front of several miles. It is a first-rate resort for children.

Southsea is really a suburb of Portsmouth, and as it possesses a fine sea common, is cheap, and is favourably situated for excursions to the Isle of Wight and other places,

it is much frequented in summer. The beach, however, is stony, but there are swimming and other baths. It is not a bad winter resort for poitrinaires, who live on the common, the soil being gravelly, and the atmosphere 5° warmer than London. A few rest-houses would be an advantage. The sanitation is also good, and it is protected to some extent by the Portsdown hills at the back.

Southampton is a most relaxing place, and though a clean town, is not suited to invalids, the smells at low water being sometimes offensive. It is *not* on the sea.

The Isle of Wight.—This small island is very undulating, but there are higher hills along the western coast and also above Ventnor, the highest, called Boniface Down, being about 800 feet above the level of the sea.

The principal resorts are: Ryde, Cowes, St. Helens, Sandown, Shanklin; Freshwater, Alum and Totland Bays, all on the sea. Newport, the capital, is a relaxing place in a hollow near Carisbrook Castle, on the Medina river, about five miles from Cowes.

Cowes is devoted to royalty and yachting. *Ryde* is a fairly large place and fashionable, with good shops, and as a permanent residence for non-invalids is the most bracing, healthy and attractive place in the island. It is built on the slope of a hill looking north-east.

Sandown is situated on the slope of a hill looking south-east. The soil, except the westerly and upper part, which is sandy, is clay. It is much frequented in summer by quiet families, the bathing and boating being splendid. Near here are the remains of a Roman villa, to see which I had to pay one shilling, and which as a show is worth about twopence.

Shanklin lies between Sandown and Ventnor. It is placed in a valley a little back from the sea, the descent to which is very steep. Shanklin, with its Chine, is a place, even in winter, of great but quiet beauty. The word *chine* seems to be confined to Hampshire and the Isle of Wight, and is an old Saxon word, signifying to cleave, a chine being a cleavage of the ground towards the coast. There are many

chines in the Isle of Wight and about Bournemouth. There is a sandy beach, good bathing, a railway-station, and a great variety of walks and drives all round.

Ventnor and Bonchurch.—Walking seaward towards the south, after a mile or so we come upon another beautiful chine, beyond which, between the cliffs and the sea as far as Bonchurch, is the Landslip—a broad, rugged, and partially wooded piece of ground much frequented by pedestrians. This Landslip is really a part of the celebrated *Undercliff*, the occupied portion of which, however, commences at Bonchurch, runs through Ventnor, and terminates at the Blackgang Chine, a distance of five or six miles. The cliffs at the back, which shelter Bonchurch and Ventnor from the north-north-east and north-west and west winds, rise at intervals from Shanklin to Chale to the height of 800 feet, and are but the exaggerated portion of the chalk downs which run half a mile or so back from the coast from Sandown to the Needles. Ventnor, then, being built on an old landslip, it is impossible to predicate the exact character of the soil, which is a heterogeneous mixture of chalk, firestone, and blue slipper or gault. The aspect of Ventnor being south-east, it is not, unless in exceptional situations, as parts of Bonchurch and the Chicken-pit, protected from the south-east and east winds; but owing to these winds being tempered by blowing over the sea, they are not, I think, so keen as at Bournemouth or St. Leonards. The mean annual temperature is 51·7°, the mean of winter 41·8°, of spring 49°, of summer 61°, and of autumn 54°. The mean of February, the coldest month, is 41°, and of August 62·4°. The highest shade temperature in August is 88°, and the lowest in February 20°. The rainfall is 26 inches, October being the wettest and April the driest month. The S.W. winds blow 60 days, N.E. 54 days, W. 52 days, N.W. 30 days, S. 26 days, N. 24 days, and S.E. 18 days. The climate is mild and equable in winter and spring, and at the same time in no way relaxing, but tonic and slightly bracing. It has been claimed by advocates that owing to the varying

elevation of the different streets and houses, and the different nature of the soil, the heat in summer is never great. While admitting that these conditions ensure a greater movement of the air than would otherwise exist, to my mind they are not sufficient to counteract the closeness and stillness incident to the situation, sheltered as it is more or less, not only from the northerly and north-easterly winds, but also from the north-westerly, which in summer often prevail. Sea fogs and mists are not uncommon; they are rare in March and April, but frequent in the fall.

For dryness, equability and mildness combined, it is probably superior to any place in England in spring and winter, but the great heat in August is a drawback for summer visitors. There is a short beach of very fine pebbles and sand, and good bathing accommodation.

As a winter residence, Ventnor is well adapted to all who cannot stand the cold and fogs of London or other inland places, and who are unable to go to the Riviera. It is also well adapted for early and threatened phthisis, convalescents from acute attacks of chest disease, and sufferers from throat, dyspeptic, hepatic, and renal affections. Hemoptysis, I have reason to believe, often occurs, but is attributable to the hilly nature of the walks and not to the air. For this reason, though most people are better a little inland, the very weak and debilitated, the hemoptic, and those troubled with heart disease, had better take up their abode close to the sea, where the air is certainly more genial and softer than elsewhere. For most consumptives, Ventnor is the best place in England.

Freshwater, Alum, and Totland Bays are charming rural seaside and woodland villages to the west of the island. They are close together, and as they are fully exposed to the Atlantic, though breezy, they are essentially healthy seaside places. There is now a railway from Newport and Cowes, and each place has its hotel, with carriages for hire.

Bournemouth, which thirty years ago was a small village, now contains 30,000 inhabitants, who generally reside in

detached dwellings, situated in their own grounds, and scattered extensively about among the pine groves. These pine woods not only impart an aromatic odour to the air, but also afford, in conjunction with the low hills, considerable protection from the north, north-east, and to some extent also from the east winds. The best sheltered part is the terrace of houses facing the little valley and river that leads down to the sea, and the east cliff is generally more sheltered than the west. There is also great shelter in many of the woods and gardens, though the roads leading to them are often exposed to the fury of the cold easterly winds.

Bournemouth is decidedly inferior to Ventnor as regards shelter from cold, though the houses are equally warm and far better protected by art against draughts than any place with which I am acquainted. The soil is sandy, dry, and absorbent, and, consequently, the air is tonic and bracing, and the full influence of the sea is modified by the distance therefrom of many of the houses, the detached position of which also contributes to the purity of the air. The mean annual temperature is 51°, that of winter 42°, of spring 49°, summer 60°, autumn 51·7°. The rainfall and humidity are moderate in amount; and, owing to the level character of much of the ground, walking is not attended with the difficulty encountered in hilly resorts.

Its special advantages seem to be due to the purity and balsamic nature of the air, together with its dryness, equability, and warmth; while, as regards shelter, it is inferior to Ventnor or Torquay, and perhaps also to St. Leonards. There is a good pier, but no sea-walk or regular frontage. There is very little difference between high and low water; but the beach is sandy, and there is good bathing.

Bournemouth is especially a winter resort, and possesses, besides the celebrated Mont Dore pine cure, numerous well-appointed hotels, pensions, and lodging-houses.

I cannot recommend it to those in need of a short but bracing midsummer seaside sojourn. Fogs often appear in spring and early summer.

It is a good winter resort for the weak and debilitated, for returned tropicals, for those below par, for delicate children convalescent from acute disease, for early phthisis, and many other forms of chest disease, and for all in need of warmth and repose. The east winds, however, they will not escape, and the parts at the back are very bleak and exposed.

Swanage is a pleasant, cool, and sedative summer resort, with a south-east aspect, fine sands, and good bathing.

Weymouth is situated on a splendid open bay, has a fine sea-wall, an even sandy beach, and is a first-rate bathing station. The air is pure and equable in autumn and winter. The situation and surrounding country are extremely beautiful.

Lyme Regis (Dorset), situated on the side of a valley on a rocky coast, is well protected from the north and east winds.

The winter climate is mild, and the summer breezy, with good bathing on a sandy beach. It is a quiet, dull place.

Sidmouth (Devon) lies in a valley enclosed by high hills. It is well known for its bold sea-views and its mild, pure, and soothing air.

Exmouth is a fine sandy bathing place, and *Budleigh Salterton*, close by, is situated in a sheltered valley open to the sea, and is a warm winter resort.

Dawlish is well protected on the north and south-west. The air is mild and humid, affording a good winter residence till the onset of the east winds, to which it is fully exposed. Visitors often complain of the proximity of the railway. There is a fine esplanade, good houses, and good sea-bathing on a sandy shore.

Salcombe is a very well sheltered, quiet, warm, but cramped, little place.

Teignmouth, on the south coast of Devon, is characterized, as are most other stations in Devon, by great humidity, many wet days, considerable rainfall (37 inches), heaviest

in October, lightest in March, great equability, and a mild, relaxing climate.

Torquay, one of our leading resorts, is beautifully situated, with a southern aspect, and is fully sheltered on the north and north-west, and partially on the north-east. The mean annual temperature is 52°, mean of winter 44°, spring 50°, and autumn 53°. The rainfall is 37 inches, falling on 200 days.

The climate is mild, genial, damp, and relaxing. It becomes, however, more invigorating the further back we ascend. The water is good, and boating, bathing, and facilities for relaxation abundant. It is well suited in winter and spring for chronic bronchitis in the old, inflammatory chronic phthisis and irritable throat affections. Delicate young children, and all those who are comfortable in a mild soothing climate, will do well, as will also cases of deficient vitality, bad circulation, and those returned tropicals who have had liver or lung inflammation.

Falmouth (Cornwall).—The situation of Falmouth is delightful. The older town, on the edge of the harbour, is hemmed in by most attractive suburbs. At either end, and on the hills behind, stand rows of handsome villas and lines of substantial terraces, surrounded by well-kept gardens, and commanding panoramic views over land and sea of wide extent and beauty. The famous harbour has more creeks and inlets than any other in the kingdom, and the noble headland of Pendennis, at its entrance, is encircled by one of the finest marine drives in the country, overlooking the harbour on one hand, and Falmouth Bay, stretching away to the Lizard, on the other.

The climate of Falmouth, and of the other stations in Cornwall, is characterized by great winter warmth, being in January 3° hotter than Pau, and by a degree of equability unequalled in Europe, the difference between the day and night temperature being only 6°. The east winds are less keen than elsewhere, and at Flushing, a townlet on the

opposite shore of the harbour, they are almost unknown. The rainfall, however, is heavy, and the humidity often extreme, and it is on these conditions, with the warmth of the ocean, and the peninsular form of the district, that the extreme mildness and equability depend. Falmouth is suited to the cases that do well at Torquay. Hemoptic phthisis longs for a bracing air, and is unsuited to moist climates. The climate of Falmouth, though perhaps as warm in the shade as the Riviera, is altogether different, and does not, as has lately been attempted, admit of comparison with the dry, bright and sunny stations of France or Italy.

Penzance is an attractive, well-built place, abounding in pleasant residences and good hotels, rising from the water's-edge on the southward shore of Mount's Bay. Immediately in front lies the wide expanse of this fair, open roadstead, with its great stretches of sandy beach, its towering cliffs on either horn, and its unique central point of grandeur—St. Michael's Mount, now island, now peninsula, whence it takes its name. 'The coast has a marvellous changeful loveliness. To the east juts out the Lizard promontory, with its serpentine cliffs richly clad in green and red; to the west the Land's End, whose granite headlands, stern and massive, are ever fretted by the Atlantic surges.'

Penzance possesses the most equable climate in the world, and is 5° warmer than London in the winter, and 2° in spring. The rainfall is 43 inches; it is much exposed to westerly winds and storms, and possesses a humid atmosphere and a large number of wet days. It is not a good place in spring. It is useful in irritable throat disease, in early phthisis, with a dry, harsh cough, and those cases that do well in a moist, warm, and relaxing climate.

St. Ives (Cornwall) possesses a climate slightly more bracing and less humid than Penzance. North-westerly winds prevail.

Newquay has a great local reputation as a summer resort, is now fairly accessible, has magnificent scenery, a bracing summer climate for the strong, and good bathing.

Westward Ho lies on a flat coast, and is a good bathing-station.

The Scilly Isles possess the mildest and most equable climate in England, and the residential capacities of St. Mary's are capable of improvement. They are reached from Penzance by well-appointed steamers in four hours.

Ilfracombe (North Devon) is pleasantly situated, and is a charming summer place. It has less rainfall and a more bracing air than South Devon, and is also a good winter resort for the fairly strong. The winter temperature is the same as Torquay. It is not a good summer place for children.

Lynton is a most picturesque place, well adapted for tourists and good swimmers, but not for bathing children and females.

Weston-super-Mare, with *Minehead* and *Clevedon*, all on the Bristol Channel, are well-frequented bathing-stations. Sand and muddy flats are numerous hereabouts.

Tenby (Wales) is an attractive little place, and is the leading resort in South Wales. The climate is salubrious, very mild, and not very damp. It is situated on the point of a rocky promontory, to the north and south of which lie the sheltered beaches. The water-supply, sanitation, and accommodation are good. Frost is very rare. It is well adapted for chest affections in spring and winter, and for recuperating and bathing in summer.

Aberystwith, on Cardigan Bay, is a leading seaside station, sheltered on the north and east, but exposed to the S.W., N.W., and N.E. winds. The climate, which is mild, equable, and damp, is 8° warmer than the inland districts in the vicinity. The beach is sloping and stony, but safe. The sanitation and water-supply are good.

Aberdovey is close by, with a similarly mild climate.

Barmouth is a somewhat glary place, with a mild, dryish climate and a sandy soil, exposing extensive sand and mud flats at low water. It is much frequented in summer, both on account of the safe bathing and the magnificent mountain scenery behind. Being built on a promontory the air

in winter, though mild, is bracing. It is a good winter station.

Beaumaris, on the Menai Straits, has an east aspect, fine scenery, and bracing air.

Llandudno, in Carnarvon, lies in a valley connecting Llandudno and Conway Bays, and is protected to the north-west by Great Orme's Head, and on the east by the Little Orme's Head. Thus, as it gets all the strong winds from the sea, the climate is highly marine and equable. In summer the North (or Llandudno) Bay is the favoured resort of bathers, the beach being sandy and the bathing excellent, while in winter the sheltered situation under the cliff is the best. The air is pure, invigorating, and tonic, being a combination of the air of the sea and the mountains. There is a splendid sea drive of five miles long. The annual rainfall is 32 inches, and the humidity 86 per cent., with 86 wet days in winter. The mean winter temperature is 43°, the daily range 9°, and the monthly range 28°. The soil is sandy, and, though drier than Devon or Cornwall, it is often very cold and windy. Both sanitation and water-supply are good.

Rhyl is twenty miles south of Liverpool, in Flint. It is a large well-frequented flat place, having fine sands, a dryish bracing air, and good summer bathing. It has also been locally recommended to poitrinaires in winter, as, owing to the distance from the crest of the hills at the back, the humidity is less than at other stations on this coast. The rainfall is 27 inches and it soon dries up, and mists and fogs, owing to the open windy situation, are rare. The mean winter temperature is 44°. Certain forms of lung and throat disease and asthma may do well, as also rheumatism and gout in winter.

Southport, about twenty miles north of Liverpool, in Lancashire, lies in a flat country. It is a fashionable place, and many wealthy people from the neighbouring towns have residences here. It possesses, amongst many other local attractions and sources of amusement, one of the longest piers

in England. The air is described as sedative, pure and fairly dry, fogs and mists being rare. It is also variable and equable, the changes being limited.

It is a good summer and autumn place for throat and lung affections, including phthisis and asthma, also for dyspepsia, constipation, rheumatism, debility after acute illness, and scrofula. The bathing is good and safe, and the sand hard, but as the sea is out of sight half the time it must often be very disagreeable.

Hoylake is a small bathing-place at the mouth of the Dee, in Cheshire; and *New Brighton*, on the south corner of the estuary of the Mersey opposite Liverpool, has a fine windy bracing location, and a good sandy beach.

Blackpool is the most popular seaside place in Lancashire, being the leading lung of its crowded manufacturing towns. It is fully exposed to the sea, and has fine sands, bracing air, good bathing accommodation and plenty of amusements. It is rather blustery at times. It is north of the Ribble, and six hours from London.

Morecambe and *Grange* are places still further north, of considerable repute, the former as a summering station only, and the latter as a winter place as well. Grange is within a drive of Windermere.

Mineral Springs.

Indifferent Springs.—Buxton is a very nice place, and is pleasantly situated in a valley surrounded by low hills, at an elevation of 1,000 feet above the sea, in Derbyshire.

The climate is wet and very variable, but, as the soil is absorbent, the water does not lie on the ground. The waters, which are alkaline in reaction, and very rich in nitrogen, have a temperature of 82°, and, though emollient to the skin, are too stimulating for active morbid conditions. These waters are skilfully applied with electro-massage and all the recent improvements, and are especially useful both as baths and when taken internally, in all forms of chronic

rheumatism and gout, as well as all other conditions for which this class of waters is recommended.

The season is in summer only, as the cold and wind are keen in spring and autumn. Buxton cannot be recommended at any time to consumptives, particularly if there is a tendency to bronchial asthma or hemorrhage.

Matlock, so well-known for the excellence of its hydropathic hotels, is not far from Buxton, and is a very pleasant summer resort. The spring has no medicinal virtues.

Sulphur Springs.—The sulphur springs are Harrogate, Llandrindod, Gilsland, Shap, and Dinsdale on Tees.

Harrogate is our principal drinking spa, possessing not only sulphurous, but saline and chalybeate properties as well. It lies in an open pleasant country 400 feet above the sea, and consists of an upper bracing part with a lower and sheltered one. The bath season is from May till September, and, although the strong may come at any season, Harrogate cannot be recommended to delicate people in winter, and least of all to poitrinaires from Southern England.

All the bath arrangements are on an elaborate scale, and the place has a high reputation and is largely frequented. The springs are numerous, and some contain barium, but they vary according to the amount of sulphur and salines they hold. The waters are stimulant, aperient, and absorbent, increasing the secretions of the intestines, stomach, and liver. They are useful in obesity and chronic hypertrophy of the womb, as well as in rheumatic, gouty, and hepatic indurations. The waters may often be drunk for months without debility resulting. A pint and a half taken warm at intervals is sufficient to purge. They may be recommended wherever cold sulphur waters are advisable. Harrogate has a bracing summer climate, and is a good place to recuperate.

Gilsland Spa, between Carlisle and Newcastle, contains hydrosulphuric acid and iron, and is useful in dyspepsia, skin diseases, and rheumatism. It is well frequented in

autumn, and is moderate in price, and not at all dull. Shap is close to Penrith, and has an elevation of 1,000 feet.

Llandrindod, in Radnorshire, is situated in a fine open country, on the railway from Euston. The air is at once pure, mild, and bracing, and, being sheltered by Radnor Forest, the winter temperature is as high as Bath or Bournemouth. It affords a very warm inland winter climate. It is now a deservedly popular bath, and possesses every requisite for the comfort of visitors. Dinsdale is near Darlington in Yorkshire.

Saline Springs.—The saline springs are Woodhall Spa, Droitwich, Nantwich, and Ashby-de-la-Zouch.

Of these Woodhall is the most important. It lies in a dull, flat, but healthy, country in the interior of Lincoln. The waters are largely exported, and with great benefit, as they are rich in iodine and bromide, and contain more sodium chloride than Homburg. When drank they are diluted and aërated with carbonic acid. Although there are good baths and hotels, this is a dull place ; it is mainly a bathing spa. The waters are useful in hepatic torpidity, the dyspepsia of bon-vivants, old constipation, obesity, induration of glands and joints, and various rheumatic and gouty complaints, as well as in other disorders for which saline baths are advisable, as threatened phthisis, and scrofulous and syphilitic diseases.

Droitwich lies in a pretty country near Worcester, and has good baths, hotels, and lodgings. These waters have been brought to Malvern.

Nantwich has needle and swimming baths and good accommodation.

Ashby-de-la-Zouch is now much frequented, the baths are improved and recreation provided. The waters of Droitwich and Nantwich are four times as strong as seawater, that of Ashby is twice as strong, while Woodhall is one-third less, containing only 2·7 per cent. of common salt. The uses of all are similar to Woodhall.

Bath Earthy Waters.—Bath is the only earthy or thermal spring of note in England. After a long period of neglect it has again shone forth with some of its pristine glory, and everything has been done, by the introduction of massage, electricity, and every recent improvement, to place it on a level with the leading Continental spas. The waters, whose temperature varies from 104° to 120°, contain about ten grains of solids in a pint. These solids are mainly sulphate of lime and soda, common salt, magnesium chloride, carbonate of lime, silicic acid, and a little iron. The water sparkles, and contains much nitrogen, oxygen, and carbonic acid. The principal seasons are spring and autumn; but as Bath has a mild, warm, healthy climate, and has many resources and agreeable society, it can also be utilized in winter. As it is a good-sized town and lies low, it is mostly too hot in summer. The baths are taken three or four times a week, the duration being from ten to thirty minutes. The waters are useful in all chronic rheumatic and gouty complications, skin diseases, uterine and vaginal disorders, chorea, dyspepsia, and all affections where earthy thermal springs do good.

Bath affords a good winter residence for returned tropicals; the temperature is the highest of any inland English town.

Purgative Waters.—The principal are at Leamington, Cheltenham, and Purton.

Leamington is situated in a level, well-cultivated country in Warwickshire, and possesses a somewhat bracing and equable climate; sudden showers, windy gusts, and mists being rarer than in hilly districts. The waters contain common salt, Glauber's salt, carbonic acid, oxygen, and nitrogen. They are purgative and alterative according to the dose, and are useful in irritative dyspepsia, constipation, renal and hepatic congestion, portal engorgement, gall-stones, gout, lithæmia, rheumatism, piles, skin diseases, and, in conjunction with the weak sulphur and iron, in chlorosis and struma. Leamington is a clean town, with 30,000 people, and affords a good permanent residence.

Cheltenham is a pleasant town, with a mild and somewhat relaxing climate, and has been long a favourite place with old Indians. The waters are purgative, saline and sulphuro-saline. They are not now much used, though they are beneficial in liver, dyspeptic and anæmic disorders.

Purton, in Wiltshire, has a dry bracing air and purgative bromo-iodated saline waters, useful in struma and threatened consumption.

Iron Waters.—Tunbridge Wells is more noted for its breezy common and fine bracing air than for its iron springs. There are no baths, and the waters are useful in anæmic and debilitated states of the system.

Malvern is not only a lovely summer resort, but, as it has a fairly dry, warm and equable climate, it is one of our best inland places in winter. In addition to the recent hydropathic improvements, Dr. Raynor's establishment has sulphur, alkaline, artificial sea, Droitwich brine, pine, electrical and massage baths.

Besides Malvern and Matlock, the principal English hydropathic establishments are Ben Rhydding, Yorkshire; Ilkley Wells and others more moderate at Ilkley, Yorkshire; Bushey and Norwood, near London; Tunbridge Wells, Kent; and Farnborough in Hampshire, where the Pumilio-pine baths and inhalations are used.

THE CLIMATE OF SCOTLAND.

The climate admits of a threefold division. First, the Western Highlands, including all the country north-west of a line drawn from the Clyde to Stonehaven, and whose elevation is from 300 to 2,000 feet. Second, the South-east Highlands, composed of rolling elevated moorlands, with valleys and flat-topped hills rising gradually, except on the north-west side, from the low country. Third, the Central and Eastern Lowlands, with the southern pastoral upland tract from Dunbar to Govan.

The whole country is variously made up of fertile valleys, rugged hills, level plains, lakes, rivers, fens, and marshes. The climate differs greatly—the west coast and the Western Highlands being mild, damp, and variable, while the north-east plains, being protected from the warm Atlantic rains by hills, are dry and cold in winter and hot in summer. Between the annual mean temperature on the east and west sides there is but little difference. At Portree in Sky the mean of January is 39° and of July 56·8°, while at Perth the mean of these months is respectively 37° and 59°. The mildness of the west side is due to the Gulf Stream rather than to latitude, for when the temperature at Edinburgh is 27°, it is 32° in the Shetland Islands in the extreme north. In summer the west coast is the coolest part of the country, for the isothermal line of 59° passes from the Solway due north to Perth, and then east to Stonehaven on the coast. On the east side the annual temperature is 4° colder in the north than in the south. South-west winds prevail from July to October, and these are the wettest months of the year. The north-east winds blow from March till June. November is the driest month. Perth, Clackmannan, and Kinross, with part of Fife, owing to the break in hills at the Clyde, are the dampest of the eastern counties. The east winds blow very keen on the east side, and the mists and fogs are often unpleasant. Nevertheless, Scotland is a very healthy country, and I have known English children subject to winter cough grow sturdy and strong as far north as Aberdeen.

It is, however, no country for invalids in winter. At Edinburgh the mean temperature is 46°, the maximum cold from zero to 22°, and the maximum heat from 73° to 88°. The average summer heat is 53°, and the rainfall is from 16 to 32 inches per annum. Snow never lies long, but nightly frosts often occur late in May.

Aberdeen has a bracing climate, and the summers in the valleys of the Dee and the Don are the most invigorating

in Great Britain. The mean temperature of Braemar is 43·6°, that of Aberdeen 45°, and the rainfall is from 30 to 37 inches.

Health Resorts.

The seaside stations which may be utilized by the English in hot summers are on the east coast—Portobello, North Berwick, and Nairn, and on the west side Ardrossan, Rothsay, Millport, Largs, and Dunoon.

Portobello and *Berwick* are best for the vigorous and youthful in summer.

Nairn, on the north-east, is well frequented.

Rothsay, in the Isle of Bute, is an admirable seaside resort, being to some extent protected by hills from the Atlantic rains.

All the places on the Firth of Clyde are beautiful, but apt to be damp in summer.

Mineral Springs.

The principal are the cold alkaline, sulphur, and saline waters of Moffat in the south, and the earthy sulphur and iron springs at Strathpeffer in Ross-shire.

The climate of Moffat is rather damp. The waters are diuretic and laxative, and are useful in skin and abdominal disorders.

Strathpeffer is well frequented, has good accommodation, fine scenery, and mud baths. The waters are diuretic and binding, and are very useful in rheumatic, dyspeptic, and cutaneous diseases.

The Scotch are very partial to hydropathic establishments, and well-appointed ones are to be found at the Bridge of Allan, Crieff, Forres, Dunblane, Pitlochry, Wemyss Bay, and other places. Though not so lively or agreeable as Ben Rhydding or other first-class English hydros, they are more economical.

The Bridge of Allan is close to Stirling and Bannockburn, in a lovely district, and is well protected from the east winds by wooded hills. It is a good place in spring.

THE CLIMATE OF IRELAND.

The centre of Ireland is one vast level limestone plain. Here, also, is the Bog of Allan. The scenery is so varied and charming that there is no element of beauty absent from one or other part of the country. Owing to the absence of an unbroken chain of western hills, the rainfall is more equally distributed, and the climate more uniform than that of England or Scotland. The prevailing winds are the warm south-westers, and the annual rainfall ranges from 30 to 40 inches. Though the fall is heaviest in Kerry, Cork, and Mayo, in no part of the country is it so heavy as in Cumberland, Cornwall, or the Scottish Highlands, or so slight as in the eastern parts of England. As there are no continuous western mountains, and as it is well known that the district to the windward of a forest is wetter than the forest itself, I have no doubt but the planting of broad belts of trees along the west coast would lessen the humidity of the country. The example of the island of Labuan before referred to supports this assertion.

The climate is humid, mild, and salubrious, the winters being softer and summers cooler than in England. The mean annual temperature is 49·6°; of January 40°, of July 59° in the north and 62° in the south; that of Great Britain being 64° in London and 54° in Scotland. The most common diseases are tubercular and fibroid consumption, rheumatism, typhoid and typhus fevers, and dyspepsia, from the excessive use of tea, potatoes, and sour milk. The east winds prevail in spring, and are very keen along the east side of the island.

The climate of Kerry is so mild that the grass on the hills is green in winter, and the arbutus flourishes in the open. Cork has also a moist, warm climate, with a rainfall of 40

or 50 inches. Cavan and Derry are cold and variable. The valley of the Liffey is mild. Wexford, particularly South Wexford, is mild, being protected by hills; and Kilkenny has the driest climate in Ireland. Generally speaking, the west is the wettest, and the north is as wet, but somewhat harsher than the south. Ireland is a healthy country. It is, however, not generally advisable to send English consumptive people to Ireland in any stage of their disease. It is a good country for returned tropicals to settle in.

Health Resorts and Spas.

Ireland possesses numerous seaside resorts suitable for a summer sojourn.

Proceeding southward from Dublin is *Kingstown*, which is more a marine residential station than a sea-bathing place.

South of Kingstown, in Wicklow, is *Bray*, the most important seaside bathing station in Ireland, with magnificent scenic surroundings, and good bathing and accommodation.

Still further south is the rural but fashionable village of *Greystones*.

In the County Wexford there are numerous seaside villages of local repute, but without hotel accommodation for distant visitors. The principal on the Channel are *Court Town* and *Rosslare*. The latter is about six miles south of Wexford town, and has an agreeable situation, with a fine sandy beach, safe bathing, and a mild but bracing summer air. It should, when the new harbour is complete, and a line of steamers sailing between it and Wales, attract many quiet English families, particularly as it is the nearest point in Ireland to London, with only forty-six miles of sea from Wales.

On the Atlantic coast of Wexford are *Cullenstown* and *Fethard*.

In Waterford the principal places are *Dunmore* and

Tramore. The latter has fair accommodation, but the air is strong, and the sea blustery at times. It is a well-frequented place.

In Cork County are *Youghal*, *Ballycotton*, *Queenstown*, and *Glengarriff* the beautiful. Queenstown is both a winter and summer resort. It is a sunny, sheltered town of about 10,000 inhabitants, situated on Cork Harbour. It is but partially under the influence of the sea. The mean winter temperature is 44°, that of spring being 50°. The rainfall is 34 inches, and the wet days 131. It is a pleasant place with a good deal of movement, and is well suited to delicate children, old people with irritative chest affections, and such as do well at Torquay or Penzance. Struma, rheumatism, and uterine disorders also do well.

On the west coast, and exposed to the full force of the briny Atlantic, are *Kilkee* in County Clare, and *Bundoran* in Donegal. Kilkee has magnificent cliff scenery, and is a well-frequented bathing station. There are fair hotels.

On the north coast are *Port Stewart* in Derry, and *Portrush*, a place of some consequence near the Giant's Causeway. It is a favourite with the Ulster people in summer.

Holywood, *Newcastle*, *Dundrum*, *Rosstrevor*, and *Warrenpoint* are in Down. Of Rosstrevor Thackeray says, 'Were such a bay on the Baltic or Mediterranean travellers would flock to it in thousands.' Being sheltered from the north and east winds by the lofty Mourne Mountains, and possessing a mild, salubrious, if somewhat damp winter climate, Rosstrevor is as well suited for invalids in winter as it is for bathing, boating, and mountain excursions in summer. This is really a charming district, and will well repay a visit. The Mourne Hotel is commodious and comfortable.

Howth is at the foot of Howth Head, near Dublin.

Mineral Springs.

The mineral springs are those of Lisdoonvarna and Lucan, near Dublin.

Lisdoonvarna is a quiet place in the County Clare, three miles from the station, and one hundred and sixty from Dublin. The climate is windy and dampish, but pure and invigorating. The springs are cold sulphurous ones, and owing to their great efficacy are well frequented from June to September. There is also chalybeate and manganese springs. The arrangements are good, and the hotels moderate and comfortable. Besides the usual rheumatic, gouty, and cutaneous affections, sleeplessness from nerve exhaustion, and chlorosis, are cured or relieved.

Lucan is also a sulphur spring, and has a fair hotel.

The only hydropathic establishment is that of St. Anne's Hill, Blarney, County Cork. It is the premier hydro of the United Kingdom, and is well attended.

ISLE OF MAN.

Douglas is the most famous summer bathing-place in the island, and is well adapted for all who require a full marine but not too boisterous a climate.

THE CHANNEL ISLANDS.

These islands possess a mild, equable, and relaxing climate, and, though fully exposed to the Atlantic gales, the north-east winds are keen in spring. The mean annual temperature of Guernsey is 51°, that of the winter 42°, spring 47°, summer 59°, and autumn 53°. The rainfall is 35 inches, falling on 164 days, and sea fogs often occur night and morning in winter and spring. The soil is gravel, and there is a good deal of sunshine. The walks are very hilly. Jersey is the largest island, and thirty miles east of Guernsey. The climate is similar to that of Guernsey.

St. Heliers is the principal town, but is inferior for invalids to the drier St. Aubin's. There is good bathing on a sandy beach, and the steamers come alongside except at low water. The climate is suited to the very old and young, to returned tropicals, and to most cases of chronic intestinal and urinary affections, as well as to asthma and convalescence from acute chest and throat affections.

CHAPTER IV.

The Climate of France, with its Health Resorts and Mineral Springs, except the Riviera.

THE CLIMATE OF FRANCE.

France lies between 42° 30′ and 51° 5′ north latitude, and may be broadly divided into the region of plains and the region of highlands, and a line drawn from the Pyrenees in the south-west to the Ardennes in the north-east would mark the line of division. The plains lie to the north and west, and the hilly districts to the east and south. France presents in miniature a sample of every European climate; and it is on this diversity, with the fertility of the soil, that the richness of the country depends. There are five main climatic divisions. First, the north-east, including Alsace and Lorraine, which occupies the region between the Rhine and Côte-d'Or and a line drawn from Mezières to Auxerre. Here the mean annual temperature is 49° in the towns, and the difference between winter and summer is 64°. The rainfall is 669 millimetres. Rain falls on 137 days, hail on 70, and storms occur 25 times in the year. South-west and north-east winds prevail, and the heaviest rain is in summer and autumn. Second, the north-west, between the Meuse and the North Sea and between La Manche and the Loire to Auxerre. The mean annual temperature is 51°, and the annual amplitude 59°. The rainfall is 548 millimetres, and it rains on 140, hails on 50, and storms on 15 days. Third, the south-west, including the country between the Loire and the Pyrenees. The mean temperature is 64°, and the difference between winter and summer

59°. Fourth, the valley of the Rhone to Viviers. Here the mean temperature is 52°, and the difference between winter and summer 64°. The rainfall is 946 millimetres, falling on 125 days, and with 30 storms in the year. North and south winds—both of which are very trying—prevail. Fifth, the Mediterranean, including Languedoc, Provence, and Roussillon. This is the warmest part of the country. The mean annual temperature is 58°, and the annual amplitude 60°. The winter is the wet season, the summers are dry, and storms are rare. The mistral dominates the western and north-east winds the eastern side. The highest temperature in the whole country occurs at Orange, 40° Cent., and the lowest at Alsace, 28° Cent.

On the whole, climate is temperate but variable. The north and north-west resemble England, with frequent rains. The centre has less frequent but heavier rains, and is the most pleasant part of the country, escaping alike the damp of the north-west and the heat of the south. Westerly winds prevail over the whole country, except the Rhone Valley, where the keen mistral, and east winds, and the hot south wind blow alternately.

Paris has an equable, healthy, and more settled climate than London. The mean temperature is 51° 4′, mean of January 36°, April 50°, July 66°, and October 52°. The river is often frozen in winter. The rainy days are 140, pretty equally distributed, but the driest month is February, and the wettest, July. The sky is overcast on 184 days, 40 days are foggy, and snow or hail falls on 18 days in the year. The fogs are not nearly so bad as in London, and the air is more exhilarating than in London or England generally.

In Haute Savoie the average elevation is 8,000 feet, rising to 15,000 at Mont Blanc. The climate is mildest round the Lake of Geneva, where the sheltered places have a good winter climate, the rainfall being only 24 inches. The rainfall on the mountains is 60 inches, and the cold at Annecy is greater than in Paris. In Savoie the rainfall at Chambéry and Aix-les-Bains is 65 inches.

Health Resorts, except the Riviera.

Biarritz.—Biarritz is a fashionable town on the Bay of Biscay, 68 miles from Paris. The rainfall is slight, and the protection from the east winds complete. Situated on a cliff facing the east it is warmed by the rays of a powerful sun ; while the configuration of the ground and the nature of the soil ensure the rapid disappearance of moisture from the surface. When the north wind blows it is cold, and snow will sometimes fall, but the prevailing wintry winds are the sea breezes from the west and north-west. The climate is exciting, while Arcachon is calming. At the latter place invalids of a nervous temperament do well, but Biarritz is suited to persons of a lethargic constitution. The winter season begins in October and ends in May ; but in summer the place is much resorted to by French and Spanish, who come to enjoy the cool sea-breezes and bathing. This is a very enjoyable place, being provided with a casino well supplied with literature and amusements. There is abundance of good music, a theatre, and every facility for riding and driving. There is no boating or yachting, as the sea is stormy, and bathing is often to be attempted only by the healthy and vigorous.

Arcachon is a large and thriving town, with a sea-frontage rather more than four miles in length. Situated on the southern shore of a land-locked bay, some forty miles south-west of Bordeaux ; built upon a sandy dune of huge extent, within a few miles of the Bay of Biscay; and nearly surrounded by pine forests, Arcachon enjoys a climate which is in many respects unique. For the six years, 1854-60, the mean winter temperature at noon at Arcachon was rather more than 50° Fahr., while at Bordeaux, during the same period, the mean temperature was 45° Fahr.

The quantity of rain is considerable, but as it falls in large quantities at a time it seldom prevents outdoor exercise. During the three winter months rain falls on 25 days, while on 41 days the sky is clear and cloudless. The

prevailing winds are south and west, and except the east wind none are unpleasant.

The climate of Arcachon is double, *i.e.*, there is a forest climate and a seashore climate; the former having a temperature which, on an average, is three degrees higher than the latter. Thus the town is divided into a *ville d'été* and *ville d'hiver*. During the summer months the houses on the beach are alone habitable, and visitors should be careful to obtain a room facing the north, and absolutely upon the seashore. There is no stately and stiff promenade as in English watering-places, but the gardens of the houses and hotels run completely down to the sand, so that the visitors have a ready access to the shore.

In the winter Arcachon is largely frequented by poitrinaires, and of late years many English have here sought relief for chest complaints of various kinds. During the winter season the recesses of the forest are solely in demand. The forest is, to a great extent, in the hands of a limited company. Boulevards and roads are cut through it in every direction. The châlets and villas are all isolated; each stands upon its own plot of ground, surrounded by a little garden and protective pine-trees, and most of them are remarkably picturesque. The winter climate is very good for erethic phthisis, inflammatory throat and chest affections, and for all who need a quiet and soothing air. Though there is a casino Arcachon is a very dull place in winter, and should be avoided by people of a melancholy disposition.

Pau lies in a basin 125 miles south of Bordeaux, and forty-eight hours from London. The mean temperature for September, October, and November is 56° 4′, for December, January, and February 42° 8′, and for March, April, and May 54°. The annual rainfall is 43 inches, and the wet days 119. The prevailing climatic conditions are moderate cold, and great heat of sun even in the coldest weather, rapid changes of temperature within moderate limits, and a still atmosphere. In spring and autumn there are heavy rains, and rain often falls in winter, but it is of

short duration, and does not often interfere with the daily walks. The evenings are chilly, the nights are cold, often with frost; but there is great protection from high winds. The climate is mild and sedative, and is well adapted for irritative conditions of the bronchial and intestinal mucous membranes, and for all diseased states associated with increased nervous or vascular action. It is useful in early phthisis if connected with irritable inflammatory pulmonic conditions in young or excitable persons. It is injurious in cases associated with nervous debility or passive congestion, and though it may help to soothe the patient in advanced consumption, it only renders more rapid the fatal denouement. It is a bright, clean, comfortable town, and has many attractions as a winter resort. The situation is inland, at an elevation of 650 feet. It is not good for rheumatism.

Seaside Resorts.

The principal French seaside resorts are, on the Channel, *Dunkirk*, which is a large seaport and military station, situated in very flat, uninteresting country. There is a casino and good bathing, with an *établissement* about two miles from the town. It is, however, but a second-rate bathing-station.

Calais has also extensive sands, separated from the crowded town, where the bathers must reside, by a ridge of sand-hills. There is a small casino. It struck me as a flat, ugly place, devoted to sailors and commerce. It should be left to the natives.

Between Calais and Boulogne are the small seaside villages of *Ambleteuse* and *Wimereux*. The latter is but four miles from Boulogne, on the railway. It consists of a number of châlets scattered about among the sand-hills, with a fair hotel, and a few cafés and lodging-houses. It is a thoroughly healthy place, with good and safe bathing, and entirely free from smells. I can thoroughly recommend it to quiet families. There are always many English at the

Hôtel des Bains, where the tariff, including the bathing, is seven francs a day.

Boulogne, from its proximity to Paris and London, the attractiveness of the port, the town, and its neighbourhood, the excellence of the sands and the bathing arrangements, the multiplicity and moderation of its hotels, and from the great variety of the high-class amusements provided at its splendid casino, must always be a much-frequented and leading seaside resort. Readers of Thackeray will find in 'The Newcomes' a beautiful description of the many charms of Boulogne, as seen from the ramparts of the old town by Colonel Newcome, his worn-out exile and hero. Boulogne is built on the River Liane, and has a population of 50,000, devoted to fishing and commerce. The beach, or *plage*, and its establishments are to the north of the jetty and port, and as the sea front has but little accommodation visitors are obliged to live in the town, which, in hot weather at low water, is in a very malodorous condition. There is no doubt but the smells are the bugbear, and though, as I took care to ascertain by extensive inquiry, they are not injurious to children, who generally remain all day on the beach, yet they are sometimes sufficient to take away the appetite in those who are dyspeptically or biliously inclined. The season is from June to the end of September, and the climate is more exhilarating than that on the opposite shores of the Channel.

La Crotoy, on the right bank of the Somme, is a quiet little place with a sandy beach, a fine sea front, and an *établissement des bains*.

St. Valéry, built principally on a hill on the opposite side, with the port lower down, is a similar, but less favoured station.

In this neighbourhood, also, is *Berck-sur-Mer*, with a celebrated marine hospital for children.

Further west are the fishing villages *Ault* and *Cayeux-sur-Mer*, and then we come to fashionable and well-patronized *Tréport*. It is at the mouth of the Bresle, and consists of

an old, or high town, and a new and fashionable quarter towards the *plage*. Besides the beach, which is pebbly at high tide and sandy at low, there is a fine *établissement des bains*, and a beautiful country, with the forest and château of Eu in the background.

Dieppe, besides the port and town, has a good but pebbly beach, nearly a mile long. Dieppe is a well-frequented, gay, and lively place, with a splendid casino, établissement, gardens, and a beautiful back country.

Veules Veulettes, *Saint Valéry en Caux*, are seaside villages with good accommodation and bathing.

Fécamp is a quiet little town of 10,000 inhabitants, with a shingly beach, a grand *établissement des bains*, and a speciality in warm baths of water and seaweed. There is good accommodation and bathing.

Etretat, the next place of importance, is picturesquely situated between two high cliffs. The situation is below the level of the sea, from which it is protected by a rocky barrier. It is a beautiful place, much frequented by artists and literary men, and possesses the usual accessories of a French seaside resort.

Westward of *Havre*, which is also a bathing-station, is *Villerville*, with a fine sandy beach and a small bathing establishment, but without a casino.

Trouville and *Deauville* are practically one town, and are much patronized, especially the former, by the more fashionable and aristocratic Parisians. The situation is pleasant, with handsome villas scattered about on the hill at the back. The hotels, bathing establishments, and casino are all got up on a magnificent scale. The beach is sandy, and the season is from June to October. There is also a good hydropathic establishment.

Deauville is on the other side of the water, and is connected with Trouville by a handsome bridge. It is noted for its sands, its casino, its racecourse, and the beautiful well-wooded back country.

A little further west is *Villers-sur-Mer*, a quiet but delightful and moderate seaside resort, with a comfortable casino.

Houlgate is a fashionable place, with firm sands, a magnificent casino, and good hydropathic establishment. *Beuzeval*, on the other side of the river, is a charming, quiet place, with good sands, but without a casino or other distractions.

Cabourg has a fine sandy beach, and is now a fashionable high-class resort.

From Cabourg to Cherbourg there are numerous quiet little seaside villages, suited to families.

Cherbourg has a bathing establishment and casino. *Granville plage* is well situated away from the town. There is a long, sandy beach, and good bathing.

Cancale and *St. Malo* are also well-frequented places in Brittany, especially the latter, as there are many amusements and distractions. *Dinard*, opposite St Malo, has also fine bathing, and is quieter than St. Malo. About ten miles up the river is *Dinan*, so well known for its picturesque situation, and the number of permanent English residents.

On the west coast of France the following stations, though exposed to the windy Atlantic, are deserving of notice, viz.:

Douarnenez, near Quimper; *Audierne*, in a storm-tossed bay, with magnificent cliff and splendid seaside scenery.

Le Croisic, near the mouth of the Loire, is a well-frequented place, with the usual accessories.

Pornic, south of the Loire, is also well-known, and is held in good local repute.

Royan, at the mouth of the Gironde, is a small place situated in a flat country.

Arcachon and *Biarritz* I have already described.

St. Juan de Luz is the station nearest the Spanish frontier, and has good bathing, with an établissement and casino; and there are always some English.

Mineral Springs.

Indifferent Springs.—Of this class the principal are Dax, Plombières, Bains, Evian, and Amphion.

Dax lies in the interior of Gascony, on the railway between Bordeaux and Bayonne, and possesses a mild, sedative climate, well suited to the erethic type of consumption. The bathing arrangements, with crystal halls and promenades, are also well suited to consumptives in winter The country is tame, but the air is loaded with saline and balsamic odours. Besides early phthisis, all diseases of the rheumatic type, and others suited to indifferent baths, are treated. It is a bad place for the languid and torpid.

Plombières lies in a valley, at an elevation of 1,300 feet, in the Vosges Mountains, and is reached by rail from Nancy. The waters, including the chalybeate table-water, are pleasant to drink, and are very plentiful and of high temperature, while the baths are large and well-appointed. Besides the usual rheumatic type of disease, the waters are in great repute in uterine disorders, obstinate dyspepsia, and the chronic diarrhœa of hot climates. It is not suited to the phthisical. *Bains* is in the neighbourhood, and has similar waters.

Evian lies on the south side of the Lake of Geneva. The waters are cold and tasteless, and are useful in dyspepsia and lithæmia. The waters of Amphion, which is close to Evian, are similar to those of Evian, with the addition of a little iron. They are unsuited to the plethoric and those subject to blood-spitting. Both these places are in a lovely country, and have a good winter climate.

Earthy Waters.—The most noted earthy springs are Bagnères de Bigorre, Contrexéville, Pougues, Vittel, St. Amand, Cransac, Capevern, Cambo, and Martigny.

Bagnères de Bigorre, which is a well-frequented spa, is romantically situated at an elevation of 1,800 feet on the railway close to the Pyrenees. All the arrangements are

excellent, and the waters are thermal, of different degrees of heat and varied composition, the main ingredients being sulphide and sulphate of lime, with small quantities of iron, arsenic, and sulphur. Season from June to mid-September. They are highly spoken of in chronic skin disease of the dartrous type, in rheumatism, and some forms of scrofula, dyspepsia, hypochondriasis, chlorosis, anæmic neuralgia, uterine and vesical irritability, indolent ulcers, caries, old sinuses, and unhealed gunshot wounds. Besides bathing, douches, lotions, injections, and drinking are prescribed. Bagnères de Bigorre is a clean little place, with a mild climate, and is well suited in winter to irritative phthisis and chest and throat affections.

Contrexéville in the Vosges, at an elevation of 1,000 feet, is a pretty little place on the railway, with a park, theatre, and good accommodation.

The Source du Pavilion is the most celebrated spring. The water is alkaline, slightly chalybeate, and has a temperature of 12° Cent. It contains lime and magnesia, with minute quantities of soda and other salts. It is especially beneficial in the cure of urinary gravel, biliary calculi, stone in the bladder, disorders of the urinary organs, gout and rheumatic gout, uterine complaints, hepatic colic, gouty diabetes, and incontinence of urine in children. The waters are diuretic and laxative, and are said to have a direct solvent influence on the lithic substance itself, wearing it away and detaching the mucus which surrounds it, rendering it jagged and in doubtful cases clearing up the nature of the case. While Vichy is noted only for one kind of gravel, these waters are locally recommended for every variety. They are also useful in hypertrophies of the prostate without degeneration, while the baths produce relaxation. Douches over the lumbar region help to drive the gravel into the bladder, and finally expel it.

Vittel, half an hour's distance from Contrexéville, has similar waters. Dr. Paul Rodet assures me that Contrexéville possesses no springs which can be compared with

those of Vittel, as the Source Salée, Source Marie, and Source des Demoiselles. The Grand Source at Vittel is also, says Dr. Rodet, superior to the Source du Pavilion at Contrexéville.

Vittel is in a lovely country not far from Nancy, and has good hotels and first-rate bathing arrangements.

Martigny des Bains, in the same neighbourhood as Vittel and Contrexéville, has waters which, as they contain more chloride of lithia, are said to be superior to either.

Pougues, in the valley of the Loire near Nevers, has waters which are useful in dyspepsia, gravel, and catarrh of the bladder.

The waters of Cransac, in Aveyron, abound in sulphate of lime and magnesia, with a little alumina. Hot air is charged with the fumes of sulphur, which can be inhaled at the Source. The waters are specially useful in enlarged livers and spleens, and in old intermittents, from the manganese they contain. They are also tonic.

Capevern, 1,300 feet elevation, lies on the railway from Tarbes to Toulouse. It has a good establishment, and the waters are used for the same diseases as Vittel and Contrexéville.

Cambo is a small place, near Bayonne, with iron and lime waters.

St. Amand, in the north of France, is noted for its thermal lime and sulphurous waters, its good establishment, and its mud baths. In this mud, which omits a nasty sulphuretted hydrogen smell, and is collected into one large room, the patients wallow for hours. These baths are celebrated in rheumatic, gouty, paralytic, and congestive hepatic disorders.

Sulphur Springs.—The principal are Barèges, Cauterets, Eaux Bonnes, Eaux Chaudes, St. Sauveur, and Bagnères de Luchon in the West Pyrenees; Amélie les Bains, Le Vernet, Olette, Escaldas, La Preste, Aix, La Bassere, and St. Christan in the East Pyrenees; St. Honoré in Central France; Bagnolles de l'Orne in Normandy; Challes,

Allevard, Uriage, and the celebrated Aix les Bains in Savoy; Enghien near Paris, and Pierrefonds near Compiègne.

Barèges.—This celebrated station possesses a variable climate, and the bathing takes place in crowded piscinæ. The waters are said to be unequalled in old wounds and chronic bony affections, and very useful in chronic rheumatic, skin, malarial, and syphilitic disorders. The waters are cold and hot, and though the mineralization is slight, they contain the baregene, and are so exciting, together with elevated air, as to aggravate skin, asthmatical, and nervous disorders. There are not many English.

Cauterets is favourably situated, and possesses a mild, settled, and sheltered climate.

The great speciality at Cauterets is the cure of atonic, tubercular, bronchitic, and laryngeal diseases, as well as chronic coryza and the diseases of females, when baths, douches, and local injections are used. Diarrhœa is also cured. Season, May till October. Like St. Sauveur, it is two hours from the railway at Pierrefitte, and lies at an elevation of 2,525 feet.

St. Sauveur has soft and emollient weak sulphur waters, in great repute among ladies, and their temperature is from 85° to 135°. It is a fashionable place, with a good mountain climate.

Eaux Bonnes lies in a narrow but beautiful valley, and has a mild and variable climate. The waters and inhalations are in great repute in laryngeal and atonic phthisical cases. It is two hours from Laruns.

Eaux Chaudes has good baths, useful in chlorotic and rheumatic affections.

Bagnères de Luchon stands at an elevation of 2,000 feet, and from June to September is by far the most pleasant, extravagant, and aristocratic place in this district, and, like Cauterets, Eaux Bonnes and Bigores, is much patronized by English. All the arrangements, alike for bathing, amusement, and comfort, are admirable. The speciality is the cure of chronic eczematous, syphilitic, and paralytic affec-

tions. The climate is mild and variable, but July and August are often very hot. It is one of the most fashionable and attractive health resorts in Europe.

Amélie les Bains lies at an elevation of 800 feet, four hours from Perpignan. It is in great repute in threatened and early phthisis of the catarrhal type. It is unsuited to hæmoptysis. The air is mild, and there are many winter visitors; and though the pulverized waters are useless in consumption, they are of great value in throat irritation.

Le Vernet has an elevation of 2,000 feet, and though, like Amélie, it gets in winter little sun, it is a winter station for consumptives. It is sheltered from the east and south winds, but open to the north. The autumn and spring climate is good. It is reached from Prades.

Olette has an elevation of 1,800 feet, with hot sulphur springs.

Escaldas is still higher up. The summer is mild, and it is resorted to for skin and bronchial affections. These places are reached *viâ* Perpignan, and are pleasant and cheap.

Preste has an elevation of 3,400 feet, and is reached by mules from Amélie. The hot waters are useful in lithiasis and urinary disorders.

Aix has an elevation of 2,400 feet, and is reached from Foix. It possesses the most abundant sulphur waters in Europe, and the hottest in the Pyrenees. All the sulphur waters we have yet described are hot.

The cold waters of St. Christan, in addition to sulphur, contain traces of arsenic and iron, and are used pulverized in chronic ophthalmia.

St. Honoré, in Central France, has sulphur waters of a temperature of 78° to 82°.

Bagnolles de l'Orne lies in a rocky forest; the waters have a temperature of 80·6°. It is a dull place, but there is a large swimming-bath.

Challes, two miles from Chambéry, has the strongest sulphur well in existence, with some iodine, bromine, potash,

and sodium. The waters are inhaled and drunk in throat affections; no bathing.

Aix les Bains, in Savoy, is perhaps the most popular English bath on the Continent, as much on account of the splendid arrangements and the beautiful scenery, as the efficacy of the waters, which, though most skilfully utilized in every possible manner, are of low mineralization, possessing but a trace of hydrosulphuric acid or sulphides. Its great advantage consists in the immense supply of a mild sulphur water of high temperature. The heat of Aix is very great from June to August; the diseases treated are gout, rheumatism, skin, paralytic, syphilitic, and cardiac affections, and metallic poisoning.

The waters of Marlios, close by, are richer in sulphur, and, with its pulverizing arrangements and inhaling-rooms, are much used in throat disease.

Allevard, elevation 1,500 feet, is in a pleasant country, one hour's drive from Grenoble. The waters are similar to those of Eaux Bonnes, but, being richer in carbonic acid and nitrogen, are more pleasant for drinking and inhaling. The speciality is the cure of phthisis and other chest and laryngeal diseases; there is also a sedative whey cure.

Uriage, elevation 1,500, also near Grenoble, possesses warm sulphuro-saline and purgative waters, very useful in skin diseases, and useful in syphilis, glandular enlargements, and mucus catarrhs, portal and abdominal obstructions, and constipation. There are also an iron spring and good hotels.

Saline Waters.—The principal are Bourbon les Bains, Bourbon l'Archambault, Balaruc and Bourbon Lancy.

Bourbon les Bains, in the Vosges Mountains, has hot saline waters (temperature 114° to 147°), with much nitrogen and carbonic acid, and has been called the Wiesbaden of France; there are bathing, drinking, and douches. The waters are useful in the malarious and hepatic enlargements of returned tropicals, sciatica, and articular rheumatism. This is a pleasant and moderate place.

Bourbon l'Archambault (*viâ* Moulins) has a local reputation for scrofula, rheumatism, and paralysis.

Balaruc is near Cette, with a mild climate, and has strong saline springs; temperature 118°.

Alkaline Springs.—The alkaline stations are: Vichy, Vals, Royat, Chatel-Guyon, Mont Doré, Châteauneuf, Vic sur Cère, Chaudes Aigues, La Bourboule, St. Nectaire, La Malou and Neris.

The French alkaline waters which are exported contain, unlike those of Germany, carbonate of lime and magnesia; they are St. Galmier, Pougues, St. Alban, and Condillac. They are pleasant in dyspepsia and urinary disorders.

Vichy is the most famous alkaline spa in Europe. It is pleasantly situated in the broad valley of the Allier, 780 feet above the sea, and can boast of a fine casino, numerous well-appointed hotels, shady walks, and much amusement. Except in July, which is very hot, the air is temperate and pure, and the season is from the middle of May to mid-September. The waters, like those of Vals, are largely exported, without any material deterioration in quality. Their main ingredients are *bicarbonate of soda and carbonic acid, with small quantities of bicarbonates of potash and magnesia, and arseniate of soda, strontium, iron, and baregene.* There are several springs, and their temperature varies from 58° to 109°. The waters taste like soda-water, and are used as baths and internally. The Source Célestine, temperature 58°, is the most pleasant.

Though pulmonary catarrh, digestive and chronic hepatic and splenic disorders are no doubt greatly benefited by these waters, the great speciality of Vichy is the cure of *urinary diseases*, as lithiasis, gravel, catarrh of the bladder, stone, diabetes, and some forms of Bright's disease. The gouty, if the constitution is good, derive great benefit, and sufferers from biliary calculi are frequently cured, and generally relieved; stone in the bladder, if not cured, is often arrested. Uterine diseases are treated here, one of the springs being called Source des Mesdames. Vichy is of great value in

chronic dysentry, abdominal enlargements, and malarial cachexia.

Vals, in Ardèche, is remarkable for the number and strength of its cold alkaline springs; though to some extent a resort, the waters are mainly exported. According to Dr. Clermont, of Lyons, they are beneficial in chronic diseases of the stomach, bowels, dysentery, hepatalgia, jaundice, hepatitis, hepatic tumours and hypertrophies, hepatic colic and calculi, cirrhosis, fatty liver, diabetes, albuminuria, chlorosis, gravel, stone and catarrh in the bladder, enlarged prostate, inflammation of the womb and vagina, amenorrhœa and sterility, gouty and rheumatic diathesis. In addition the Source Dommigue is beneficial in chlorosis, anæmia, necrosis, neuralgia, cardialgia, agues and malarial cachexia, splenic enlargement, skin diseases, rachitis, scrofula, tuberculous disease (lymphatic type), chronic bronchitis. This Source contains arsenic, and the dose is about six glasses a day.

Chatel-Guyon is close to the Riom station, and has warm alkaline waters with the addition of iron and Glauber's salts. They are, unlike other alkaline springs, laxative, and are used in abdominal, hepatic and splenic obstructions, and uterine diseases.

Châteauneuf is 14 miles from Riom; has weak alkaline waters.

Vic sur Cère, in the Cantal, with a railway station, elevation 2,100 feet; warm waters similar to Royat.

Chaudes Aigues, in the Cantal, has weak alkaline springs; temperature 143° to 178°; used in rheumatic and joint diseases. It is dull and remote.

Mont Doré is in the valley of the Dordogne, at an elevation of 3,300 feet, in a romantic country among the hills of Auvergne, and close to the railway.

The waters are weakly alkaline, and the temperature varies from 90° to 104°. Drinking, douches, inhalations, hot bathing, and foot-baths are used. Season from the 15th June to September. The specialty is the cure of

chronic bronchitis and threatened consumption, as well as chronic throat, eye, and nasal affection, asthma, and hay-fever. At first the baths induce the bath-fever, with lassitude. The cure of asthma is effected in the *salles d'aspiration* by the inhalation of dense hot vapours, aided by hot spinal douches, foot-baths, and drinking. Unless complicated with emphysema, regular baths are not given in the asthma cure. After undergoing this process the patient is brought back to bed and wrapped up in blankets for an hour.

Those with a slow circulation or a hemorrhagic tendency should not go to Mont Doré. The course lasts a fortnight. Mont Doré is near Clermont-Ferrand. The Mont Doré cure is best carried out on the spot.

Royat is a fashionable bath, and lies in a gorge on an elevation of 1,400 feet, just outside Clermont-Ferrand. The arrangements are good, and the waters contain, besides soda, small quantities of lithia and arseniate of iron, on which their specialty depends. As at Aix-les-Bains, Mont Doré, and other places, *salles d'aspiration et de pulverisation*, douches and carbonic-acid baths are used. There is a swimming-bath, and aqueous gymnastics. Sources of recreation are also well attended to.

Though these waters are curative of many diseases, their great specialty is *gout*, but gout only when associated with the anæmic or atonic condition.

Gouty dyspepsia, gouty eczema, gouty asthma, owing to the influence of lithia and arseniate of iron, are generally cured. Acne, especially the red-nosed variety, and other chronic cutaneous gouty conditions, as gouty diabetes and kidney anæmia, chlorosis, and certain diseases peculiar to females, are also relieved. The waters are also most efficacious when inhaled, in gouty throat affections, catarrhal bronchitis, and early phthisis. The climate is variable, showery, and gusty, with a very hot sun, much dust, and hardly any shade. The mornings and evenings are exhilarating and pleasant. Royat is surrounded by hills, except towards Clermont.

La Bourboule is near Mont Doré, and has waters similar to Royat, with the addition of a large amount of arseniate of soda and a little iron. The temperature of the waters is very high, and as their constitution resembles the serum of the blood, they are highly praised in all cases of defective nutrition, anæmia, tropical anæmia, chronic paludal poisoning, general debility, arrested development, threatened consumption, scrofulous and osseous ulcerations, skin diseases, especially of the hepatic, gouty, or scrofulous types, chlorosis, glandular and hepatic enlargements in children and adults, and chronic rheumatic and gouty affections. Diabetes, associated with skin diseases in worn-out subjects, does well. La Bourboule lies in an open valley at an elevaof 2,700 feet, and the climate in summer is dry, bracing, warm, and variable. Royat, Mont Doré, and La Bourboule are the leading springs of Central France, and are reached *viâ* Clermont-Ferrand.

The hot waters of Neris, in Central France, are useful in nervous and hysterical excitement, rheumatism, and prurigo. Neris is a pretty place near the railway.

The iron waters of France are at Bauche, near Chambéry, and at Forges-les-Eaux (Lower Seine). They are useful in anæmia, chlorosis, diarrhœa, and sterility.

The waters of La Malou, in the south, contain soda, arsenic, iron, lithia, and copper, and have a high reputation in nervous and female affections, and also in locomotor ataxy.

CHAPTER V.

The Riviera—Switzerland—Corsica—Malta—The Canaries and Madeira—Health Resorts and Springs.

The Western Riviera.

The Western Riviera extends in its widest, but not in its strictly geographical sense, along the Mediterranean shore from Hyères to Pegli. It has long enjoyed a deserved reputation as a winter health resort for consumption and many other diseases, to which delicate invalids, who dread the cold and fogs of our insular climate, are subject. The climatic characteristics of this beautiful region during the winter months are sunshine, warmth, dryness, and considerable equability, with an almost entire shelter from the north winds, and a considerable shelter from the north-west and north-east winds—the western stations from the latter and the eastern from the former. The most important stations from west to east are Hyères, Cannes, Nice, and Menton in France, Monaco and Monte Carlo, and in Italy Bordighera, Ospedaletti, San Remo, Alassio and Pegli. St. Raphael west of Cannes, and Beaulieu east of Nice, are also beautiful semi-rural winter stations with good accommodation. While the main climatic characteristics of all these stations, and many other smaller ones are similar, each has its own secondary qualities more or less suited to different phases of consumption, or other diseases for which the Riviera is found beneficial.

These secondary qualities are due in a great measure to the degree of shelter afforded by the mountains, and to the

more or less limited space between their bases and the shore. The former helps to shut out the cold winds from the north, while the latter often modifies the bracing character of the climate, giving rise to a sensation of closeness owing to the want of circulation in the air.

Hyères.—Hyères is situated about three miles from the sea, and for those who cannot stand or do not like the influence of the sea and the sea-breezes, this is an advantage. It has a sunny south and south-eastern aspect, and the air is neither so dry nor exciting as at Cannes or Nice. It is fully exposed to the mistral, which often blows with great force from February till the end of the season. In winter the temperature is rarely lower than 44°. The town, however, is warmer than the valley, in which heavy dews fall at sunset. The water supply is good, the sanitation satisfactory; the walks are numerous and pleasant, and the hotels good, and for the Riviera cheap. There are, however, but few villas. Hyères is suitable for the nervous and excitable, and for cases of phthisis in which there is a hemorrhagic tendency; it is not favourable to the asthmatic or scrofulous. It is rather a dull place. Two miles from Hyères is the beautiful and well-sheltered valley of Costabelle surrounded by pine woods with good hotels, and some villas. This place is destined to become a leading resort.

Cannes.—This beautiful and spacious resort is situated on a small bay, five hours journey by rail from Marseilles. The location is expansive, and as there is a great distance from one end of the place to the other, so also are there varying degrees of climate. Owing, however, to its open situation and the distance of the northern mountains, it is not very well protected, and is consequently rather windy, the air being frequently in movement.

The prevailing winds are easterly, and in October the winds, whether easterly or westerly, are apt to be high, while in November the rainy wind continues from one to three weeks. These winds are not cold, then comes a few days of mistral, to be followed by the mild east wind till February.

In March the winds are sometimes very strong, and are accompanied by torrential rains. The temperature is about 10° warmer than London, but is not so warm as Menton or San Remo. March is the worst month; the heat in April is like mid-summer in England.

The winter rainfall is about 32 inches, with 58 wet days. Snow is very rare, and never lies more than a few hours. A fog is a phenomenon. Occasionally, however, as at other stations, a very bad winter attended with much rain and great cold may be expected.

The surrounding country is beautiful, and, unlike most other places in the Riviera, forest scenery is close to the town. It is a very fashionable, expensive place, well provided with all necessaries and luxuries of life.

The air is tonic, invigorating and sometimes exciting, but less so at Cannet, which is a little way inland, than in Cannes itself.

All except the scrofulous and lymphatic are best away from the shore. The climate of Cannes is useful in scrofula, anæmia, asthma, emphysema, chronic laryngitis, chronic pleurisy, chronic consumption (especially away from the sea), chronic gout, rheumatism, and Bright's disease. Catarrhal bronchitis does well by the sea. It is ill-adapted for nervous complaints.

Grasse, nine miles from Cannes, is 1,000 feet above the sea-level; it is a sunny well-sheltered place, but somewhat colder than Cannes.

Antibes has also a pleasant climate, but is not considered so mild as Cannes.

Nice.—Nice is a large town with about 70,000 inhabitants. It is a gay and amusing place, and is better adapted to the dilettante than the genuine invalid. The air is, however, pure, dry, and exciting. The sun is strong, and there are fewer rainy days than in most other places; some torrential rains fall in spring and autumn, and a cold north-easterly mist is not uncommon in mid-winter. Towards the end of winter the violent mistral, with clouds of dust, is remark-

ably trying. Nice is a very good place for returned tropicals and sufferers from atonic dyspepsia, if they can stand the cold and variable winds; it is also a good place for hepatic torpidity, but unsuited to the excitable and irritable. Debilitated elderly persons with a tendency to catarrhal attacks generally do well. The climate, however, it must be remembered, is treacherous, and has to be carefully guarded against.

The relative humidity at 2 p.m. is 59·6°. From October to May the sunny days number 135, cloudy 55·3, rainy 52·1. The rainfall is 32·4 inches, with 19 inches for the winter, the heaviest being in October and April; March, April and May are the most blustery months, and the mistral in February and March is attended with clouds of dust.

Carabacel is the best protected part.

Cimiez is also better suited for chest affections than Nice itself, the air being less exciting. These places are a little way from the sea.

Monaco and Monte Carlo.—The mean annual temperature of Monaco is 2° higher than that of Menton, and 3° higher than Nice (Yeo); it is well adapted for a health resort, and the lower quarter, called Condamine, enjoys great protection from south, north, and west winds. Monte Carlo and Roquebrune are most beautiful, and sheltered from all winds but those of the south and south-east. There is no level ground.

Menton is fifteen miles from Nice, and is well sheltered by a semicircular ridge of mountains rising to an elevation of 4,000 feet.

The part on the western bay is subject to far greater movement of the air, owing to its greater distance from the hills, than the *eastern* side, where the mountains come close to the town, and the air is often still and confined. The temperature of the east bay is about 2° hotter than the western, and the air contains a greater degree of humidity. 'The eastern bay,' says Dean Alford, 'is simply a sun-trap at mid-day.' The east bay thus has a close and sedative

atmosphere, with only one good walk, viz., that along the dusty main road.

The western bay possesses a fine bracing and windy climate, being exposed to the mistral, which blows in a modified form three or four days every month; it, however, enjoys shelter from the east wind.

Speaking of the east bay, Dean Alford says: 'There is no edge in the breeze, no sea-air breathing from the waves.' It is perfectly sheltered from all strong winds, and is well adapted to the needs of the very old and debilitated, to convalescents from acute inflammation, and to the more irritable form of consumption. The walks, except the Promenade du Midi, are hilly, and trying to delicate invalids. Menton is a dull place, being entirely given up to invalids.

Bordighera is three miles on the Italian side of the frontier at Ventimiglia. It is situated on a promontory jutting in the sea, and therefore possesses a more marine and equable climate than other stations on the Riviera. It is fully exposed to the westerly and southerly winds from the sea, but is well sheltered from the cold north, north-east, and north-west winds by the mountains to the north.

Bordighera has, unlike most other places, a level space occupied by olive-groves and palms between the hills and sea, which is well adapted for walks and building sites.

Though the temperature is about the same as at Nice, Bordighera is the mildest and most equable of the health resorts of the Riviera. Here the mistral is a seaborne and slightly moist wind. Owing to its situation it is cooler than other places in the spring-time.

It is well suited to scrofulous phthisis, bronchial and throat inflammations without hemorrhage, and anæmia, but is not well adapted for nervous disorders.

A few miles beyond Bordighera is Ospedaletti, closely sheltered on every side by wooded hills. There are good hotels and several villas. Visitors are mostly Germans.

San Remo.—Beyond Ospedaletti is the important but unpicturesque station and town of San Remo. It is well pro-

tected from the northerly winds, and is warmer and more equable than the more western stations on the coast. It is therefore well suited to the nervous and excitable. The cold north-east wind blows occasionally in winter and spring, and the mistral also sometimes puts in an appearance. The soil is clay. There is plenty of good accommodation, an Italian opera, and fair shops. There are but few drives, and mountain excursions are generally impracticable. This is, perhaps, on the whole, one of the best stations on the Riviera. The east side is moister than the west.

Alassio.—Alassio is twenty-eight miles east of San Remo, and most accessible *viâ* Turin and Savona. It well protected on the north side, has a fine sandy beach, and is surrounded by beautiful scenery.

The climate is dry, with heavy dews at night. It is not suited for asthmatics, at least near the sea.

Pegli is a suburb of Genoa, with which it is connected by rail and tram. It is well protected by hills to the north, east, and west. The air is more humid than most other places, and is in repute for spasmodic asthma, and for the relief of those who have found the western station too exciting or irritating. In the smaller stations the accommodation and food is sometimes inferior. Pegli and Sestri are rapidly coming to the fore, but there are very few English.

Eastern Riviera.

Nervi is another suburb on the east of Genoa, and has a similar but damper climate than Pegli.

Genoa has a variable climate, attended frequently with cold wind and rain. It is unsuited to poitrinaires, but will answer the needs of those who go south merely to avoid the cold and fogs of a northern winter.

Rapallo with *St. Margherita* are well-sheltered stations, twenty-two miles east of Genoa. This is a very lovely place.

Spezia has 20,000 inhabitants and a naval arsenal. The climate is warm, dampish, calm, and fairly equable, and

free from dust. There are good hotels. It is not protected from the prevailing winds.

Varaggio, between Spezia and Leghorn, has also a mild climate.

The Eastern Riviera is slightly damper and more exposed than the Western, and, as it is not so largely frequented, does not possess the same accommodation for invalids.

Patients benefited by a winter sojourn on the Riviera are:

1. Poitrinaires, who, although in a pretty good state of health, cannot stand the cold and fogs of England.

2. Those with an hereditary tendency to consumption, sufferers from bronchitis and asthma, chronic rheumatism; sufferers from chronic bladder and kidney disease; chilly persons, with a languid circulation and weak hearts, who become frozen instead of warm when they walk out at home; scrofulous children, convalescents from long illnesses, and sufferers from diabetes.

3. Sufferers from acute inflammatory asthma, loss of sleep and nervous irritability (Hyères, Nervi, Pegli, and Rapallo); atonic chronic bronchitis (hilly parts of Cannes, and Nice).

4. Persons easily subject to winter catarrh, which runs down to the lungs.

5. Clergyman's and other forms of chronic sore throat are best at the moister and more soothing stations.

6. The cases of consumption that do best are early phthisis, with no inflammatory or febrile symptoms, or in the late stage with cavities when the general health is fairly good. Those in the very last stage, young people with rapid tubercular consumption, and cases of rapid softening following pneumonia, must not expect much benefit from the climate of the Riviera.

7. Laryngeal, hemoptic and intercurrent diarrhœal complications are generally benefited, but patients subject to hemorrhage should leave the Riviera for a cooler climate about the middle of April (Marcet).

8. The Riviera is also well suited as a winter residence to the very young and the very old, and particularly for scrofulo-bronchitic children struggling for existence in the cities of England. Returned tropicals do well also. Heart, brain, and spinal diseases, as well as pneumonia and pleurisy, derive but little benefit, but convalescents in general, when the active lesions have passed away, may hope for relief.

On the Riviera, as in all other foreign resorts, a room far removed from the basement, and with a southern aspect, should be selected. Patients should avoid sitting about, even in the sun, on cold iron or other seats, or rambling through old churches and museums; but should they do so it is necessary to be provided with an extra wrap, to act as a protective against the sudden changes of temperature that often occur. All invalids should be in the house at sunset, both to avoid the rapid chilling of the air and to escape the influence of chill, which about this hour is of common occurrence. They would also do well to break their journey at some intermediate station on going and returning.

Switzerland

Lies between 46° and 48° N. lat. The country mainly consists of the great basins of the Rhône and the Rhine, enclosed by two immense mountain chains, together with valleys of the Aare and the Thur, shut in by the northern outliers of the Alps, the Rhine and Jura.

The main chain of the Alps attains an elevation of 15,300 feet, and its north expansion 14,026 feet. The mean height of the Aare valley is 1,378 feet; the lowest level is over 900 feet, while the lowest level of the whole country is 646 feet, on Lake Maggiore.

Of the total area (15,962 square miles) 71 per cent. is productive, while 28 per cent. is not productive; 709 square miles are glaciers, 520 lakes, 90 beds of rivers, 62 towns, villages, and houses.

Most of the great rivers are torrents at their source, and there are extensive embankments to prevent inundation.

The scenery is sublime, magnificent, and beautiful; frowning mountains, yawning precipices, perpetual snow, and glacial seas contrast at every turn with smiling valleys, purling streams, pleasant towns, and lovely lakes. As the elevation varies from 650 to 15,000 feet, the climate is wonderfully diversified, the heat of the valleys being sometimes oppressive, while in the more elevated regions the cold is intense.

At an elevation of 800 feet, the mean temperature is +8°·83 Cent.; of summer +17°·28; of winter −1°·05; while at Hospice of St. Bernard (7,600 feet) it is −1°·09 Cent.

On the Italian side the winter lasts three months; in Glarus four, Engadine six, St. Gothard eight, and St. Bernard during the entire winter.

At Bellinzona the mean temperature is 54½° Fah., at Geneva and Basle 49½°, Chur 48½°, Interlaken 48°, St. Bernard 30°, St. Théodule 20°. The Alps divide the force of the heaviest summer rains from the heaviest autumn ones, the winter and spring precipitation being nearly the same. The rainfall increases towards the mountains on the north and south, their escarpments and the valleys trending towards the lowlands being wetter than the more elevated upland valleys, protected by lofty ridges. The annual rainfall at Basle is 35 inches, 64 at Beatenberg above Interlaken, 69 at Schwytz, 102 at St. Bernardino, and 63 at Lugano.

In the Rhine basin the heaviest rain is in summer, 38 inches, and in winter 18. In the Ticino the heaviest is in autumn, 37, summer 27, winter 12; while in the Rhône valley it is pretty equally distributed throughout the year, 100 inches being the annual fall. The annual fall in the Rhine valley is 105, in Ticino 96 inches. The percentage of snow in the total annual rainfall varies from 63 at St. Gothard to 6 at Geneva, the average being 34 per cent. in the Grisons.

The Föhn, a strong south-west or south wind, blows very

hot and dry towards the north of the country, but moist towards the south. It is really a kind of sirocco, and is of most frequent occurrence in spring.

There is also a local day and night valley wind, and cloud-streams, caused by the condensation of the air and the dissipation of the moisture by the wind, often occur. Storms, hail, landslips, and earthquakes often occur, and the dangers of glaciers are familiar to all.

Since the mountain resorts have become fashionable, we hear much of the superiority of mountain air, and there can be no question of the justification of this opinion among Europeans in the tropics. In temperate Europe, however, the evidence is by no means convincing, at all events as regards the effect of rarefied air on permanent residents, for among this class pneumonia, dysentery, diarrhœa, throat affections, and low fevers are most common, and the monks of St. Bernard after a few years often succumb to asthmatic disease.

Tuberculosis is common in some elevated situations, and remarkably rare in others. It is rare at Interlaken (1,700 feet) and the surrounding mountains, but common at Gais (2,875 feet) and in the valley of the Château d'Oex (2,900 feet). In the manufacturing towns (3,000 to 3,500 feet) phthisis is as common as in similar places in the low country. Chlorosis and the anoxyæmia of altitudes are frequent enough.

At Leukerbad, elevation 4,500 feet, chest inflammations are frequent and severe. Consumption, however, is said to be absent at Davos and other high, well-sheltered valleys, but pneumonia is not uncommon.

Mineral Springs.

The indifferent springs of Pfeffers are situated, at an elevation of over 2,000 feet, off the valley of the Rhine, in a narrow ravine on the road to Davos, while Ragatz, to which the waters are conveyed, is 500 feet lower down in an open

valley, with fine scenery. The climate is mild and equable. The waters are specially recommended in nervous, neuralgic, skin and rheumatic complaints, and in the diseases of women. There are douches and vapour arrangements.

Earthy Waters.—The springs of Leuk, whose temperature varies from 93° to 120°, are four hours from the railway at Sion, and lie in a valley 4,500 feet above the sea. The climate is variable, with considerable extremes.

The baths are common, males and females bathing together, and long immersion, which is the speciality of the place, is kept up.

The waters are very useful in skin diseases, even psoriasis and lepra being sometimes benefited. The place is well frequented from June to September.

The drinking springs of Weissenburg, not far from Thun, are also *earthy*, and are in great repute in chronic bronchitis. It is a pretty but dull place, and is crowded with consumptives; the elevation is 2,759 feet, and the accommodation is good.

The well-frequented sulphur springs of Baden lie on the railway near Zürich, and are in a pleasant country; there is a casino and good accommodation and arrangements. The effects are mainly those of thermal waters, as the amount of hydrosulphuric acid is trifling; douches and vapours are used. Near Baden are the sulphur waters of Schinznach, which are very rich in hydrosulphuric acid, and of very great value in skin affections, and also in plethoric digestive disorders, as they contain much sulphate of soda.

The hot sulphur springs of Lavey are near the St. Maurice station, in the valley of the Rhine. These are slow places, but well suited to genuine patients.

Stachelberg has an elevation of 2,000 feet, and a cold sulphur spring, two hours' drive from Glarus. Skin and chest affections, especially the latter, with milk and whey cures, are attended to. Lenk, near Weissenburg, has an elevation of 3,400 feet, with baths, douches, and inhalation rooms; and the baths of Gurnigel are four hours from

Berne, at an elevation of 3,800 feet, in the midst of pine forests. These cold springs contain sulphate of lime and iron, and are very useful in hepatic and bronchial affections; the accommodation is good. The soda sulphur springs of Heustrich, near Thun, are also beneficial in bronchial catarrh.

Le Prese is a mild sulphur spring, 3,000 feet above the sea, near the road from the Engadine to Italy; it is remarkable for its beautiful scenery and mild climate, being sheltered from the north and north-east winds. Baths of whey and the fresh herb-cure are available. Dr. McPherson speaks highly of the climate of Le Prese. The springs of Alveneu lie between Chur and St. Moritz.

Tarasp.—Among purgative waters Tarasp, in the Lower Engadine, at an elevation of 4,000 feet, is the most important, containing twice as much carbonate of soda and common salt as Glauber-salt, a little iron, and much carbonic acid.

It is principally a drinking spring, and has been found beneficial in gall-stones, hepatic and splenic enlargement, catarrh of the stomach, general obesity, and chronic laryngeal and bronchial catarrhs. It is contra-indicated in *tuberculosis*. There is good accommodation both here and at Vulpera and Schuls close by. This place, though difficult of access, is well frequented.

The waters of St. Moritz, in the Upper Engadine, are mildly chalybeate. Besides the drinking there are bathing and local douches.

These waters are pleasant and popular, and are, together with mountain air, beneficial in debility, chlorosis, anæmia, low forms of neuralgia, and low nervous complaints. The air in fine weather is exhilarating, and country delightful. The season is short. It is eleven hours' drive from the station at Chur.

Winter Mountain Resorts.

Davos-Platz.—Davos-Platz, in the Grisons, which from its accessibility and sheltered position is the most favoured

of our mountain health-resorts, lies at an elevation of 5,108 feet above the level of the sea, in a valley ten miles long, and about half a mile broad, running N.N.W. and S.S.E., and fairly well sheltered on all sides except the S.E. It has two distinct and sharply-divided seasons—the summer and the winter. The winter approaches suddenly in the first half of November — the morning dawns bright and clear, when suddenly snow begins to fall, covering the green of the valley with a mantle of white, which it retains till the end of March, with a cloudless or cirrhoid sky, passingly interrupted only by the mild though somewhat frequent snowstorms, and by the occasional visitation of the *Föhn*, or south-west wind, which, melting the snow, usually lying at a depth of from two to four feet, is a source of considerable annoyance and mischief to invalids.

The barometric pressure varies from 24·62 inches to 25·02.

The thermometric observations, according to Dr. Theodore Williams, give a mean temperature for the winter months, based on four years, of 28°·1 Fah. The maxima range is from 75° Fah., to 12°·5 Fah.; the mean maximum of the four years being 39° Fah. The minima range is from 43°·1 Fah. in October, to – 16°·7 Fah. in December; the mean minimum for the four years being 17·3° Fahr. The maxima only exceeded 60° Fah. on eight days, and the minimum fell below 0° Fah. on eleven days. The black bulb yielded the following results of solar radiation, giving a total minimum of 114°·4 Fah. and a maximum of 166°, and by placing a black cloth behind the bulb a temperature sufficient to boil water was attained. This permeability does not increase with great altitudes, as it is as high at Davos as at the Fluella Pass, 2,700 feet higher up (Frankland).

The humidity varies between 72 and 62 per cent. of saturation, which indicates a fairly dry climate. The number of days on which rain or snow falls is about 50 per cent. of winter, and the rest of the days are for the most part sunshiny. But little moisture falls as rain, and

nearly all as snow; and when snow falls, owing to the dryness and low temperature it does not cling to the clothes, consequently invalids sometimes go out in the snow with impunity, and about two-thirds of the days can be relied on for walks and drives. The prevalent winds are north, north-east, and south-west, and the latter, called the *Föhn*, is most dreaded, on account of its melting the snow, and thus disturbing the winter conditions of equilibrium of climate. Wind, however, is generally very slight in force, and the air is generally calm, or the cold would be unendurable.

Williams says: 'The effects of the Davos climate appear to be due to—1. The rarefaction of the atmosphere; 2. Its dryness; 3. The absence of wind, partly owing to the shelter of the mountains and partly to the uniform layer of snow spread around; 4. The large amount of sun's rays transmitted through the rarefied atmosphere, as reflected on to the village from the extensive snow-plain lying to the east of it.'

The low shade temperature, which at night occasionally falls below 16° Fah., and which taken with the high solar day temperature, in which the patients sit about, indicates an enormous range of diurnal variation, the effects of which have to be carefully guarded against. This, and the rapid changes of temperature, the not infrequent mists and fogs and the occasional occurrence of the Föhn, are the drawbacks which interfere alike with the ventilation of the rooms, the comfort of the visitors, and contribute to catarrhs and inflammatory attacks. Yet it is generally agreed upon, that patients may take more liberties with the climate than in the low country.

The winter climate of Davos, then, is characterized by a still, dry, cold and rarefied air, with great solar mid-day heat, and extreme cold in the shade, particularly at night, and by the great purity and freedom from germs of the atmosphere at all times. From this description of the climate it will appear evident that Davos is no place for

advanced consumption. Unless an invalid be able to take exercise, and enjoy the pure, cold, exhilarating air, he is, to say nothing of the chilly discomfort and monotony, pretty sure to suffer from a winter sojourn at Davos-Platz. But as these drawbacks are due not so much to the cold *per se*, but to cold intensified by the great diurnal ranges of temperature, and assisted by the occurrence of the mists and south wind, as proved by their coincidence with catarrhs, a summer sojourn will be attended with great advantage to many patients, whose low vitality or too extensive local disease renders them unfit to stand the healing conditions of the winter season, for in summer, as in winter, the air is still clear, pure, rare and exhilarating. Thus it appears that either in its winter or its summer aspect the climate of Davos is one from which all judiciously selected poitrinaires may expect improvement in, many arrest of, and some the cure of, their malady. Suitable patients may expect cure in the first stage, and sometimes in the second; and when the powers of the constitution are good, though the lung may be considerably diseased, they may hope for arrest, or at least considerable improvement.

Cases complicated with hemorrhage sometimes die suddenly, and should be very careful as regards exercise at Davos, and as exercise is indispensable such cases are better away.

Hectic disappears, the patient increases in weight, the predisposition to bronchitis is overcome, nervous asthma is less capricious than elsewhere, functional cases of heart disease do fairly well; but organic heart, brain, and spinal affections should never be sent here. The cure is the air—milk, brandy, and modified hydropathy being its palliative attendants. For a new arrival a process of acclimatization of varying, but in general of several days' duration, has sometimes to be undergone, and is attended with dyspnœa, sleeplessness, occasional asthma, and headache. During this time all exercise must be avoided, and the greatest

quietness submitted to. All should be under cover early. Young people with a good deal of physical strength, even with a cavity or limited consolidation, are pretty sure to get well, even if the local disease is somewhat advanced. Strongly hereditary cases, particularly those associated with hectic, diarrhœa, rapid pulse, and neurotic and digestive disturbance, even if the local disease is slight, generally do badly. But with these conditions, if the local disease is extensive, it is folly to send them to Davos. In suitable cases, however, much good is done, for the purity and freedom from germs of the air places the ulcers in the most favourable healing condition and help to arrest suppuration, while rarefaction calls into activity diseased or disused patches of lung. Some who have stayed during the snow-melting time have found the climate no damper, though warmer, and consequently more relaxing, than at intervals throughout the winter. The climate also is very good for dyspepsia. Some patients who have been to Davos speak of the place as dull and depressing, and the climate as damp and unpleasant, indicating, no doubt, great difference between one season and another. The sanitation and drainage are good, and the hotels, particularly the Hôtel Belvedere, have double windows, and are comfortable, with a dry equable air. Sometimes when the drawing-rooms are full the heat is unpleasant.

The railway is now continued to Klosters, which leaves only two hours by coach to Davos.

The summer climate resembles the Engadine, being cool and rather windy, with a daily valley wind.

Maloja in the Lower Engadine, and *Wiesen* in the Davos Valley, are also in great repute as winter stations. Maloja is highly spoken of by Dr. Tucker Wise, the accomplished English physician.

The Engadine Valley.—This valley is situated in the south-east of the Swiss Alps, in the Canton of the Grisons. It is the highest of the Swiss valleys, the elevation of St. Moritz being 5,859 feet. Its length is about fifty miles, and its

breadth ranges from one and a half miles in the Lower Engadine, to three in the Upper. It is approached by Zürich and Chur over the Julier Pass, from Davos over the Fluela Pass into the Lower Engadine, and from Italy by Como and the Maloggia Pass.

The principal stations are St. Moritz, Pontresina, Zug, Campfèr, Samaden, Sils, and Silva Plana.

The valley of St. Moritz is fully exposed to the south-west winds, and partially to those of the north, but is sheltered from the north-west and east winds. Its open situation is, however, rather an advantage than otherwise in the season, which lasts from June till early September. Owing to the proximity and height of the southern mountains the full benefit of the sun is not enjoyed by the Engadine stations. The mean temperature during this season is 51°·8, that of the morning being 42°·8, evening 48°·2, and mid-day 59° to 60°. Two-thirds of the days are dry and sunny, one-third rainy. Morning dews are common, but fogs are rare for a mountainous district. Snow falls very rarely in the summer, and does not lie; while in winter it remains close upon six months. Sudden changes of temperature, owing to the varying direction of the winds, are frequent both in winter and summer. Diurnal changes are also great; thus after a hot summer's day the thermometer may fall to 32° at night, while in winter the heat may vary between 25° and 41°. Spring and winter are apt to be damp, but summer and early autumn are usually dry. Snow falls early in November, preceded by unsettled weather; but after some time, when the snow gets hard, the weather becomes bright and dry. The snow melts in March under the influence of the hot winds, and entirely disappears by the end of April.

The baths of St. Moritz have already been described.

Pontresina is about half an hour's drive from St. Moritz, and is situated in a narrow valley in a beautiful well-wooded country. It is therefore better sheltered than St. Moritz, and is the most convenient station for Alpine climbing.

The summer nights, though generally cold, are yet, when the south wind blows, still, warm, and balmy. November and December are foggy, but January, February, and March are calm and clear. The air even in midsummer is pure, dry, and invigorating; and, as it is highly conducive to health, a month's sojourn in summer is sure, in suitable cases, to have a beneficial effect; but the benefit is greater during the first than during subsequent visits.

Other mountain resorts are Grindelwald, famed for its sledging and skating; Rigi, Leuk, Andermatt, Zermatt, and Eggischhorn; while lower down are Herden, Albisbrunnen, Gais, Engelberg, and Fideris. Between 3,580 and 4,700 feet, with a bracing climate and freedom from the harsh, cold air of the upper regions, are Chaumont (above Neuchâtel), Kaltbad, St. Beatenberg, and Monte Generoso, overlooking Lake Lugano. Seewis (3,000 feet) is warm and protected.

Near Geneva and the Rhône Valley are the well-sheltered stations of Montreux, Glion, Les Avants, Bex, Les Ormonts, Villars-sur-Ollon, Champéry, and Chamonix Courmayeur on the Italian side, and Gurnigel in the Canton of Berne.

These stations have generally good accommodation, and, though variable and rather moist, are much visited in October and November, as well as in April and May, and are advantageous points of call for invalids returning from the Riviera or from Davos during the snow-melting time. Of these stations Bex and Montreux are the best sheltered from the bise and other cold winds.

Montreux.—The winter climate of Montreux is crisp, bright, calm, and sunny; for, though the rainfall is heavy (50 inches), there are a great number of fine clear days. The best season is autumn, then spring, then winter.

Glion and *Les Avants* are respectively 1,000 and 2,000 feet higher up, and afford, when desired, a pleasant change from Montreux.

The hotels and boarding-houses are numerous and good, and well arranged to suit the needs of visitors. The following diseases do well at Montreux: threatened and

chronic consumption without fever, chronic granular throat diseases, winter cough, chronic bronchial catarrh, pleurisy, and valvular and irritable heart affections.

Corsica, Malta, the Canary Islands, and Madeira.

Corsica.—The coasts are generally low, and the centre hilly. The scenery is magnificent, and the climate agreeable, soothing, and tonic, possessing neither the great moisture of Madeira, nor yet the dry stimulating character of Nice and Cannes. Ajaccio is the principal town, and with the neighbouring hill villages of Orezza with its iron, and Guagno, with its sulphur springs, affords an agreeable climate for invalids—Ajaccio itself in the winter, and the hill villages in the summer. Ajaccio is a neat, clean, little town, situated on a fine sandy bay, well protected from the north and north-east cold winds, but open to the south-west. There is a good harbour for yachts. The mean winter temperature is 54° Fah., and the spring 59°, and the daily range is never very great. The humidity is about 80 per cent, with 35 rainy days in spring and winter, and there is, unlike the Riviera, but little dust. There are many lovely drives and walks. The air is generally found very agreeable by poitrinaires, speedily relieving the breathing, especially during January and February. There is good hotel and villa accommodation, and a good sprinkling of English society.

Bastia has a warm, pleasant climate. It is unsuited to invalids.

Malta is a hot, glary, crowded place; and, although the winter climate is warm, equable and dry, and consequently well suited to poitrinaires, the associated conditions, such as the bad roads, expensive accommodation, the prevalence of fevers, and the diseases of childhood, and the faulty sanitary state of Valetta, and its noisy suburb, Sliema, render it an unsuitable place of residence for invalids. The mean winter temperature is from 51° to 71° Fah., that

of summer being between 80° and 90°. The rainfall is 32 inches, and is heaviest between December and February, while the relative humidity is 62 per cent. The moist sirocco blows for about 80 days in spring and autumn. The most common diseases among the troops are dysentery, continued fevers, hepatitis, and affections of the stomach. Phthisis is principally attributed to the dust and confinement.

Canaries.

These islands possess great advantages as a winter health resort. The towns most frequented by the English are, in the island of Teneriffe, Santa Cruz, Lajuna, Orotova (Port and Villa), and Icod; and in the Grand Canary the town of Las Palmas. There are also other places, but they are without accommodation for invalids.

Santa Cruz is the port of entry into Teneriffe, and I may say here that the landing everywhere is by boats. The town contains 20,000 people, and has two good Spanish hotels, where the tariff is five or six shillings a day, and Comacho's English hotel, where it is eight. At Comacho the sanitation is good, and the water-supply of the town is of good quality. Throughout the islands the roads in the towns are badly paved, but in the country districts the main roads, unlike what one sees in Madeira and Morocco, are in splendid condition. The cooking and attendance at the hotels are good. Bands and the other usual amusements are got up, and excursions into the country are moderate.

Lajuna is five miles from Santa Cruz, at an elevation of 2,000 feet, and is the summer resort of the well-to-do Santa Cruzians. The climate is delightful for the greater part of the year, and, unlike most of the scenery of Teneriffe, which is bare, Lajuna is surrounded by semi-tropical forests. There is a good hotel, where visitors may either remain, or push forward on the morrow to Orotova, which is twenty-six miles distant from Santa Cruz, on the other side of the island.

Orotova comprises the Villa Orotova, of 1,000 feet elevation, with the first-class sanitorium of Dr. Creagh, who resides close by, and the Puerta Orotova, which is on the sea. The valley of Orotova is fifteen miles long by ten broad, and has considerable scenic attractions. The principal hotel at the Puerta is the Grand, which is unexceptionable in quality, but rather expensive for Teneriffe, viz., twelve francs.

A good road leads from Orotova to Icod, where there is a good hotel. From here the Peak can be ascended (12,180 feet elevation) with safety, but with considerable labour. At Puerta Orotova there is an English boarding-house—Turnbull's. The drainage is everywhere into cesspools, but Dr. Thurston, a recent visitor, says he noticed no bad smells. There is no English doctor at Puerta Orotova, but the Drs. Perez are familiar with English manners and needs.

Grand Canary.—Las Palmas has a population of 27,000, and is on the opposite side of the bay from the port, where there is a good anchorage, and with which it is connected by a good road and a fine sandy beach four miles long. There are two good English, and two good Spanish hotels, and a new English one in course of erection. There is an English club, good bathing, and an English doctor. It is the most frequented place in the islands. Another island which also has a good hotel is called Palma. This must not be confounded with the town of Las Palmas, which we have just been describing.

There is a natural mineral table-water in Grand Canary which resembles Apollinaris; but, as it contains a little sulphate of soda, it should not be used by new-comers, who are apt to suffer from diarrhœa.

The climate of the Canaries is moderately dry, the eastern islands being drier than the western, and the east side of each island drier than the west. Dr. Thurston believes Las Palmas to be the driest town in the islands, and gives the relative humidity at 66·7 per cent. at 9 a.m.,

and 71 at 9 p.m. The humidity of Orotova is about the same, while the minimum humidity of Funchal is 71, as compared with 67 per cent. at Orotova.

The annual rainfall is about 14 inches, and the number of rainy days 51. The north-east trade wind blows from November till July or August, and cools the air, hence July and August are generally cooler than September and October. Invalids should therefore not arrive before November. The mean annual temperature at Puerta Orotova, according to Dr. Ohrvalls, is 71° in November, December 69°, January 71°, February 66°, March 68°; Las Palmas is 2° cooler. The lowest winter temperature is 48°, and the highest 82° at Orotova, and 71° at Las Palmas. The greatest diurnal amplitude is only 14°, and the mean about 10°.

At Orotova, owing to the influence of the Peak, the cloud-line is between 4,000 and 8,000 feet high. This condition, while tempering the summer heat, excludes the sun in winter, and sometimes gives rise to a sense of closeness in the air. On the whole, the climate of these islands is very warm, very equable, and fairly dry, with but little rain and small number of wet days. It is suited to many delicate people subject to inflammatory chest and throat affections, to consumption of the erethic type in the very early stage, and to sufferers from Bright's disease and diabetes. Delicate people with weak circulation, and all who love a warm climate, will feel happy in the Canaries, for to them it will afford a haven of comfort and rest.

Madeira.

The island of Madeira lies off the south coast of Morocco, in lat. 32° N., and has long been celebrated as a health resort. The mean annual temperature, according to Mr. J. W. Johnstone, at Funchal, at an elevation of 80 feet, is as follows:

Average maximum, 65°·8; highest maximum, 90°; lowest 42°; mean of August and September (hottest months), 72°;

mean of January, February and March, 60° (coldest); mean of winter, 61°·8; spring 64°, summer 70°, autumn 68°. The daily range from November to April is 6°·1, and the annual daily average 10°.

The wettest months are November, December, January, and March; the rainfall varies between 16 and 49 inches, the average being 30 inches; the number of rainy days is 80. The mean humidity is 75 per cent. of saturation, but it is much greater in the winter. Funchal is somewhat protected by the central range, but hot winds blow from the Sahara occasionally, causing the hills to be hotter than the plains, and raising the temperature to 93°. Snow never falls on the coast or on the mountains below 2,000 feet, storms are rare. The air is often moisture-laden and steamy; the climate is, however, exceedingly uniform, equable, and fine, and well adapted for inflammatory chest and throat affections, for the erethic form of consumption, and in some forms of fibroid phthisis associated with a weak circulation. Invalids should not arrive till after the early autumn rains. Though the hotels are very good, the villas are better.

CHAPTER VI.

Belgium, Holland, Germany, and Austria, with their Health Resorts and Mineral Springs, and Prevailing Diseases.

BELGIUM.

Excepting towards the east and south, where there are a few elevations rising to 2,000 feet, Belgium is a flat country, and the climate is not unlike England, except that it is colder in winter and hotter in summer. The low north-western districts are damp and foggy, while the eastern parts are drier and more bracing.

Frost as a rule occurs at Brussels from the first of November till the middle of April. The mean temperature is 50°·6, the mean maximum is 57°, and the mean minimum 42°, with 197 wet days in the year, 60 foggy ones, and 15 with storms and thunder; the rainfall is about 28 inches.

Brussels and the eastern parts afford an agreeable residence, but Belgium is not to be recommended to persons subject to throat and chest disorders or to cold subjects. It is, however, a healthy, well-cultivated country.

Seaside Resorts.

The seaside stations are Ostend, Blankenberghe, Heyst, and Middelkerk.

Ostend is a prosperous, but low-lying place, with good bathing and ample accommodation. The King resides here in summer, owing to which, and to its convenient situation and many attractions, Ostend is one of the most crowded Continental seaside summer resorts. There is a grand casino and plenty of amusement.

Blankenberghe is a much smaller place, near Ostend, and is noted for its good bathing and sand-baths.

Heyst is but an offshoot of Blankenberg, and *Middelkerk* lies between Ostend and Dunkirk. All these places are well frequented, and have a fine, bracing, hot summer air.

Mineral Springs.

Spa is the principal bath. Of this place, Dr. McPherson says that it has everything to recommend it—viz., good waters, agreeable country, excellent arrangements, plenty of amusement, shady walks and wooded hills around. The waters are chalybeate, and are pleasant to the taste. There is also a bathing establishment, but the very hot waters are not desirable. Peat baths of great value are also to be had. The diseases cured are the anæmic and chlorotic complaints of females. The waters are weaker and less stimulating to the skin than those of Schwalbach; they are, however, of great value wherever iron waters are indicated. The iron-springs of Malmedy are close to Spa, but within the Prussian frontier.

HOLLAND.

This country, being marshy and lower than the sea, and having numerous rivers, canals, and bays, is cold, moist, and foggy; and in winter the rivers, canals, and Zuyder Zee are frozen. The mean temperature of the year is 49°·8 Fah., that of January 35°·4, of May 55°, July 68°, and October 50°. North-west and south-west winds predominate over north-east and south-east ones in the proportion of 59 to 41. The former are wet and moderately cold, while the latter are dry and cutting. The annual rainfall is about 27 inches, and the wet days 148. The climate is changeable and disagreeable, and the air heavy and damp; it varies, however, in different districts. The most aguish and foggy provinces are Holland, Zeeland, and Friesland; the other parts are drier. The mortality for the whole country is 1 in 36, and for

Brabant, Limburg, and Drenthe, 1 in 42. Malarial fevers prevail in Holland, Zeeland, and Friesland.

Seaside Resorts.

The seaside resorts are Scheveningen, a very good bathing station, close to the Hague, but dear and aristocratic; and Zandvoort, quiet and cheap, and not far from Haarlem. The Dutch and Flemish coasts being low, the seaside scenery is not interesting; but the old cities of the interior are never far away, and will well repay a visit.

Visitors who wish to take apartments in the French and Netherlands stations will, as a rule, have to hire or bring servants, as attendance is unusual, and if given is very unsatisfactory.

GERMANY.

(Lat. between 47° and 55° 52′ N.)

Germany is divided into three regions: the North, a low sandy plain, interspersed with numerous forests and marshes, and extending from Belgium to Russia; the Middle, a mountainous region; and the South, an elevated region backed up by the German Alps and the Carpathians. The South and Central regions are composed of large plains or low plateaux, like the valley of the Rhine.

The climate is not so mild or equable as West Europe, nor so extreme as that of Russia. Over the western parts, and over the whole, to some extent, the cold is modified by the moist and mild Atlantic breezes. The mean annual temperature of Bavaria, Würtemberg, and Baden is from 52° to 54°; of Central Germany, from 48° to 50°; and of the North, from 46° to 48°. The coldest parts are Pomerania and East and West Prussia, in the north-east; the mean being for Pomerania 44°, East Prussia 43°, West Prussia 44°. The warmest parts are the low valleys of the Rhine, the Moselle, the Main, and the Neckar. Here the mean summer temperature is 66°; and the winters are never severe, frosts being rare.

The climate of Hanover, and the country between Holland and the Elbe, is maritime or semi-maritime, being moist and foggy near the coast, and variable near the Hartz Mountains towards the south.

The annual mean temperature of Germany is from 60° to 52, and the mean of January is 21°.

It is drier than the western countries of Europe. The heaviest rainfall is in the Western and Bavarian Highlands, being about 34 inches, both in the Black Forest, and round the Eifel Mountains, the Hartz Wald, and the hilly Rhine districts. In the Erzgebirge, and the lowlands of the south-west, and on the north-west coast, it is 31 inches. Prussia and Pomerania have 24 inches. The Rhine and Main valleys, the Palatinate, Mecklenburg, Brandenburg, Saxony, the plateau of Thuringia, West Prussia and Posen, have 16 to 20 inches.

The best part of Germany for a winter or permanent residence is the valley of the Rhine, at Baden-Baden, Bonn, Wiesbaden and Carlsruhe, as the climate is mild and dry. The heat in summer is, however, much greater than in England. The climate of the drier parts of Germany, though not specially to be recommended to consumptives, is favourable to the weak-chested.

Seaside Resorts.

The principal German seaside places are Heligoland, Cuxhaven, and the isles of Fohren, Barkum, and Norderney.

Heligoland is reached from *Hamburg* or *Cuxhaven*. There are two islands, a rocky and inhabited one, and a low, sandy one, which is occupied by the bathing establishment, and is forlorn in winter. The bathers are carried across in boats.

The mean temperature for June is 57°, July 62°, August 61°, and January 31°. May and June are disagreeable.

It is a good station for those in need of a full sea climate and a bracing air, like that of the high-seas.

Norderney is also in good repute, and lies off the Hanoverian coast.

Mineral Springs.

Indifferent Springs.—The principal indifferent springs are Wildbad, Badenweiler, Schlangenbad, Warmbrunnen, and Landeck. The two latter are in Silesia.

Wildbad is picturesquely situated, at an elevation of 1,300 feet, in the Black Forest, and is reached by Paris and Strasburg. The waters have a temperature of 90° and 97°. This is a pleasant place, and is popular with the English who suffer from rheumatic and other complaints suitable to this class of waters. Everything is up to the mark.

Badenweiler lies also in the Black Forest, an hour by coach from the railway at Müllheim, at an elevation of 1,450 feet. The temperature of the waters is about 80°. There is a swimming bath, a whey cure, and good accommodation. Diseases of the lungs and throat are attended to.

Schlangenbad is a quiet, but pleasant and shady, place near Wiesbaden.

The baths are well arranged, and are said to have cosmetic as well as pleasant and invigorating effects. They are specially useful in uterine affections, hysteria, nervous excitement, and skin diseases. The elevation is 930 feet; and there are mud baths, and milk and whey cures.

Earthy Springs.—Lippspringe, near Paderborn in Westphalia, has a most equable climate, and is in local repute in chest affections. There are drinking, bathing, and nitrogen inhalations. Inselbad, a short drive from Paderborn, has baths which are richer in nitrogen than Lippspringe, and contain iron, and are used as baths and inhalations in threatened and early phthisis.

Sulphur Waters.—The sulphur waters are Aix-la-Chapelle and Burtscheid; Weilbach, in Nassau; Nenndorf, in Hesse: Elisen, in Lippe-Schomburg; Meinberg, in Lippe-Detmold; and Langenbrücken, in Baden.

Aix-la-Chapelle, in Rhenish Prussia, and close to the Belgian frontier, is the great sulphur bath of Germany,

having an excellent supply of hot waters. Aix-la-Chapelle is a large town, surrounded by well-wooded hills.

Although all the arrangements are good, these waters owe their great reputation to their heat and abundance, and to the happy combination of sulphur and common salt which they contain, the proportion being 1 grain of the sulphuret of sodium and 20 grains of the chloride to 16 ounces. They also contain sulphuretted hydrogen, and there is a mild iron water, sometimes used as an after-cure. These waters are unpleasant to taste, and are used mainly for bathing, and as vapour baths, douches, and massage. The Elisen is the drinking spring.

The diseases cured are rheumatism, scrofula, skin diseases, syphilis, chronic syphilis of the liver or other internal organs, gout, uterine disease, old ulcers, sprains, thickened joints and ligaments, and chronic metallic poisoning.

Dr. McPherson recommends them also in fatty liver and phthisis. They are injurious if there is a tendency to internal hemorrhage. The season is from June to the end of September, but they are available throughout the year.

Burtscheid is a suburb of Aix, and has similar waters; Weilbach is in some local repute; Nenndorf is rich in hydrosulphuric acid, and has sulphur, mud, and saline baths, the whey cure, and inhaling arrangements. It is a pleasant place. At Meinberg there are sulphur baths, carbonic acid baths, a pneumatic apparatus and a drinking salt-spring. It is reached from the Detmold station, and is well frequented.

Saline Waters.—The cold salt-waters are Kissingen, Homburg, Kreuznach, Cronthal, Niederbrunn, Soden, and Dürkheim. The hot springs are Baden-Baden, Wiesbaden, Soden, Liebenzell, Nauheim, Canstatt, and Rehme-Oeynhausen.

Kissingen is situated in the fertile valley of the Saale, in Bavaria, thirty miles from Würzburg. It is 800 feet above the sea, yet the air in mid-summer is hot and close. The waters are tonic, laxative, and alterative, and contain besides

common salt, sulphate of magnesia, carbonate of lime, chlorides of potassium and magnesium, and small quantities of chloride of lithium, bromide of sodium, carbonate of iron, and much carbonic acid. There are several springs, the principal being the Rakoczy, three to six glasses being the morning dose, while the milder Pandur spring is drunk in the evening; there is also a purgative spring, and the Maxbrunnen is a pleasant table-water. The Kissingen waters are palatable, and increase the intestinal and other mucous secretions; they are of great benefit in dyspepsia, and those liver and uterine disorders which are caused by changed abdominal circulation and nutrition; they are also useful in anæmia, gout, and rheumatism, hysteria, hypochondriasis, flatulence and obstinate constipation in congestion of the liver and kidneys, mesenteric disease, strumous enlargements, gravel and stone in the bladder. Kissingen is well frequented by the English, and it is a fairly lively place.

Four and a half miles from Kissingen is Bocklet, with several chalybeate springs, and a weak sulphur one. The douches of Bocklet are in great repute in sterility, and in breaking the abortive habit.

Homburg, on the railway near Frankfort, at an elevation of 600 feet, with a variable, but invigorating summer climate, is, perhaps, the most popular and amusing bath in Europe. Americans and English predominate. The springs are similar but more powerful than Kissingen, while they are equally abundant and various, and all the arrangements alike for health, pleasure, and comfort, could hardly be surpassed. 'To Homburg,' says Dr. McPherson, 'come the fine lady to recruit from her dissipation of the season, the bon-vivant to recruit his impaired and languid digestion, and the clergyman and merchant for relaxation;' youth and beauty, and the votaries of fashion are also well-represented.

Besides the diseases cured at Kissingen, these waters are in repute in obesity and sexual debility, gastralgia, splenic congestion, anæmia, chlorosis, and, in small doses, in diarrhœa. The dose is three or four tumblerfuls fasting,

which have a slight laxative effect. The waters are principally drunk, though there are new baths heated with steam.

Homburg is not a good place for the delicate-chested.

Salzschlirf, on the Giessen-Fulda Railway, has saline waters, with the strongest known lithia well; and they are useful in gout and bladder affections.

Soden, at the south foot of the Taunus Mountains, has a mild, sedative climate, and is recommended for delicate children and in threatened consumption, chorea, and bronchitic and laryngeal affections.

Kreuznach, in the Rheinland, near Bingen, is a pleasant place with a mild climate. The strong saline baths have long been found efficacious in scrofula and struma. There are 73 grains of common salt in the 16 ounces, and small quantities of iodine and bromide of magnesium, and oxide of iron. The temperature is 54°, but the baths are taken tepid, 'the slimy mother-lye' being left in the water. Besides scrofula and struma, these baths, which are also used as douches and injections, are very effectual in chronic uterine enlargements, malpositions, and inflammation. Fibroid tumours are often benefited, and, according to local authorities, even removed after three or four seasons. The drinking also greatly helps in the cure. The baths are taken one hour after drinking, the duration being from a quarter to three-quarters of an hour.

There are many English, and the place is comfortable and sufficiently lively. The season is from the first of May till the end of September.

Münster, near Kreuznach, has a picturesque situation, and warmer waters than the latter.

Cronthal is near Soden, and has very pleasant, weak saline waters.

Wiesbaden is situated in a valley, open only to the south, and is very hot in summer, but the winter and autumn climate is mild. It is one of the greatest thermal springs in Europe. The drinking source, the Kochbrunnen, has from 43 to 56 grains of common salt in the pint, and the

temperature of the hottest spring is 156° Fah. Owing to their heat, and the quantity of carbonic acid they contain, these waters are very useful in irritability of the stomach and chronic diarrhœa. The baths are in great repute for chronic stiffness and thickenings of joints and ligaments, sprains, and gouty states. They are also soothing and beneficial in piles, hepatic congestion, and skin diseases connected with gout or abdominal plethora. They are injurious in uterine congestion, debility, apoplectic cachexia, and when there is a tendency to hemorrhage. They disagree if, from being pleasant, they suddenly excite a loathing, or if they cause palpitation, prostration, and loss of appetite. The course is four weeks.

The splendid baths of Baden-Baden are situated in a lovely country easily reached from Strasburg. They are rather weak, a litre containing two grammes of sodium chloride, with a little chloride of lithium and a trace of arsenic. The temperature varies from 115° to 144°. There are all kinds of baths, including vapour, swimming, hot-air, electric; with rooms for massage, mechanical treatment, and compressed air. The climate is warm, and both here and at Wiesbaden the establishments are open in winter. The waters are principally used as baths, and are useful in scrofula, diabetes, anæmia, syphilis, metallic poisoning, chronic catarrh, and inflammation of the stomach, and kidney diseases, and in functional heart affections when the 'terrain-cur' can be carried out, and also in rheumatic and gouty affections.

The tepid waters of Liebenzell are situated near Wildbad, and contain a little sodium chloride, iron, and carbonic acid. They are very soothing.

Canstatt, near Stuttgart, has tepid, moderately strong, saline waters, with a little iron, and a mild winter climate. They are beneficial in dyspepsia.

Nauheim has saline waters very rich in carbonic acid, with a temperature of from 83° to 100°. The Sprudel rises nine feet into the air, and emits volumes of vapour. Nau-

heim is a dull, wet, moderate place, surrounded by hills, near Homburg, and on the line from Frankfort. It is principally a bathing place, inhalations and carbonic acid gas baths being also given. These gas baths have been highly recommended in rheumatic cardiac affections; but to my knowledge they sometimes do harm to the heart while relieving the stiffness, etc. There are not many English, but Scandinavians are numerous.

Dürkheim, in Rhenish Bavaria, has a saline bath, and a whey and grape cure.

Rehme Oeynhausen. The magnificent saline thermal baths of this place are conveniently situated in a pleasant valley on the railway from Cologne to Minden, in Westphalia, and are in great repute and largely patronized by the North Germans. The temperature is 92°, and the waters are strong and principally used for bathing. There is a grand inhalation pavilion, useful in paralysis and spinal affections. The climate is moist and mild, and not very hot in summer.

Alkaline Waters.—The German waters containing soda and common salt, which are exported charged with carbonic acid (ten ounces to one pint most pleasant), are Apollinaris, Wilhelmsquelle, Roisdorf, Seltzers, Schwalheim, and the Kronquelle from Salzbrunn.

The alkaline baths are Ems, Neuenahr, Teinach, Salzbrunn, and Heilbrunnen.

Ems, or Bad Ems, lies in a deep, narrow, mountain valley, fifteen miles from Wiesbaden, at an elevation of 290 feet, in Nassau. It has long been well known and largely frequented by the English. The waters are mildly alkaline, the strongest containing 21·7 grains of bicarbonate of soda with much carbonic acid.

The Source Krauchen (temperature 85°) and Kesselbrunnen (temperature 115°) are used for drinking; the Bubenquelle (temperature 104°), for uterine douches only, at 90°. The other hot springs are used as baths. There is a mild chalybeate. The diseases cured are principally

affections of the uterus, for which Ems is in the highest repute; catarrh of the stomach with warm water, dyspepsia with cold; chronic diarrhœa and dysentery, laryngeal and bronchial catarrhs. There is a 'terrain cur' and gas inhalations. The climate is mild, moist, and soothing to irritable bronchial complaints.

Fachingen, nine miles from Nassau, has waters like Ems, which are useful in dyspepsia.

Neuenahr is pleasantly situated in the Ahr Valley, between Bonn and Coblentz. The waters are rich in carbonic acid, and in taste resemble warmed Seltzer. They are valuable in disorders of the mucous membrane; of the bladder, larynx, liver, kidneys, lungs, and uterus; also in eczema, prurigo, and rheumatism. Their temperature is 88° Fah.

Teinach is fifteen miles from Wildbad, and the waters are cold and alkaline.

Salzbrunn, in Upper Silesia, at an elevation of 1,220 feet, has cold alkaline waters and a tonic climate. The waters are similar to those of Ems, and are used in digestive, bronchitic, and bladder diseases, and early phthisis. There is a whey cure.

The Source Kronquelle, a weak alkaline water, has been largely exported, and is of great value in uric acid, uratic and cystine gravel—the class of cases in which alkaline waters are most useful. The Kronquelle is also useful in biliary concretions, incontinence of urine, and in gouty states of the throat, bronchi, and stomach. The dose is a bottle a day, taken between meals, on an empty stomach, for a month or six weeks. When taking this water the diet should be moderate, and all heavy meat and sugared dishes, candied fruits, sweet wines and acids should be avoided.

Iron Springs.—The principal iron springs are Schwalbach, Wildungen, Pyrmont, Bocklet, Steben, Brückenau, Reinerz, Liebenstein, Driburg, and Alexisbad, and the Black Forest group.

Of these Schwalbach is the most celebrated, on account of the high percentage of carbonate of iron held in solution by an excess of carbonic acid. These waters stimulate the skin and are very agreeable to bathe in. They also hold a little soda, magnesia, and chalk. Schwalbach is most popular with the English and Americans, and is conveniently situated, eight miles from Wiesbaden, at an elevation of 900 feet, in a narrow valley among the hills. It is very handy for the after-cure, following the many alkaline and saline spas hereabouts. The climate is rather bracing, and in summer is either extremely hot or coldish and wet. There are pleasant shady walks.

The waters are useful in chlorosis, anæmia, convalescence, neuralgia, hysterical paralysis and debility, and in torpid and anæmic dyspepsia, and constipation. The season is from the first of June till the end of August, when it is crowded.

The Black Forest group of iron waters, which are reached by coach from Appenweier, contain, besides iron and much carbonic acid, some sulphate of soda. They are: Petersthal, elevation 1,333 feet, with good accommodation. Griesbach, 1,614 feet above the sea, is a popular ladies' bath, with pine-baths and inhalation rooms. Rippoldsau, elevation 1,886 feet, lies in a narrow, beautiful, well-wooded valley; there is a large establishment: drinking, bathing and pine-baths being used. These waters, besides their use in chlorosis, etc., are also of value in abdominal and portal plethora, and are preferable to Carlsbad and Marienbad, where these conditions are connected with a tendency to diarrhœa, in those who have suffered from dysentery. When these waters are not strong enough to purge, the prepared Natrone water is added. The season is from June to the end of August.

Wildungen is a scattered place in an open semi-woodland country, reached by the railway from Cassel. The waters are carbonated, earthy, as well as ferruginous, and are very efficacious in affections of the bladder and kidneys. The springs are numerous, and are pleasant to the taste. There

are many English and other foreigners. It is a pleasant place, with good accommodation and shady walks.

Reinerz, elevation 1,786 feet, has alkaline, earthy wells, iron and mud baths and a whey cure. The climate is mild and damp. The waters are useful in bronchial catarrh and torpid tuberculosis in summer. It is well patronized.

Brückenau is some little distance from Kissingen, in a forest, has weak ferruginous waters, and the peat cure. Useful and agreeable in dyspepsia. It is comfortable and cheap. Steben, elevation 2,000 feet, has strong iron waters and strong iron peat baths. It is a pleasant, comfortable place, five hours from the railway station.

Purgative Waters.—Friedrichshall, in Saxe-Meiningen.

The waters are mainly exported, and are extremely beneficial when it is necessary to act on the liver, kidney and intestines.

The water is bitter, salty, clear and odourless, and is rich in common salt, Glaubers salt, and Epsom salts. Dose from three ounces to one pint.

The baths of Elster, in Saxony, lie in a beautiful valley, 1,500 feet high. The waters, similar in other respects, contain more iron and lithia than the Bohemian group, to be referred to presently. There are peat and whey cures, with good and moderate accommodation.*

AUSTRIA-HUNGARY.

Austria-Hungary lies between the 45th and 51st degree of north latitude. Austria proper, with Bohemia and Transylvania, contains many mountains and hilly districts, while Hungary is a great plain watered by the Danube and its tributaries. The climate has been divided into three

* At Görberadorf, in Silesia, at an elevation of 1,700 feet, and possessing a cold winter climate, is the sanatorium of Dr. Brelimer, for the cure of consumption by good nourishment, cold douches, and careful attention to exercise in the open air. There is a similar establishment at Falkenstein, near Homburg, at an elevation of 1,800 feet. Falkenstein is well sheltered on the north and east by woods and hills. Pension, twelve shillings per diem.

zones, according to the latitude. The south division includes Dalmatia, Carniola, Croatia, South Hungary and Slavonia. Here the winters are short and mild, and snow is rare, and the summers are hot and prolonged, especially along the Dalmatian coast, where the heat is intense. The central zone includes the Tyrol, Austria, Salzburg, Carinthia, South Moravia, and Bohemia, almost the whole of Hungary and Transylvania. In this region the winters are long and very cold; but the summers, though shorter than in the southern district, are as hot while they last. The northern zone includes North and Central Bohemia, North Moravia, and all Silesia and Galicia. Here the winters are very severe, but the summers nearly as hot as in the other divisions.

The mean annual temperature varies from 59° in the south to 48° in the north. The mean of Vienna is 50°, the highest 94°, and the lowest 2°. In the hills the mean is 36° or 40°.

Hungary, and the east districts generally, are very dry, with a rainfall of about 14 inches. In the southern districts the heaviest rainfall is in spring and autumn, while in the north and centre it is in summer. In the Alps the fall is about 50 inches, and storms are frequent, while in other parts it is about 24 inches. Though subject to considerable variations, the climate is, on the whole, one of the finest, healthiest, and most exhilarating in the world. With the exception of intermittent and remittent fevers, which prevail along the Danube and other large rivers subject to floodings, and phthisis, which is exceedingly prevalent, especially in the large manufacturing cities, there are no diseases specially deserving of notice.

Mineral Springs.

Indifferent Waters.—The baths of this class are: Teplitz and Schönau in North Bohemia, Gastein in Salzburg, Tobelbad, and Römerbad.

Teplitz and Schönau have vast establishments, and the

waters, which are of high temperature and abundant, have a high reputation. This is the original type of indifferent waters. There is a peat cure in the vicinity.

Near here also is Eichwald, in a forest, and a great resort of pulmonary invalids.

Teplitz is one of the best frequented spas in Europe, and it lies amid magnificent scenery. Besides the ordinary diseases, unhealed gun-shot wounds are attended to. English and Americans are numerous.

Gastein is, owing to its altitude (3,200 feet), beautiful scenery, shady walks, and proximity to the railway at Lend, perhaps the most fashionable and delightful of the indifferent thermal springs in Europe. All the arrangements are excellent, and the place is generally full. Owing to the heavy rains in June and July, and the coldness and variability of the climate, the season is short. From the middle of July till early September is the most favourable weather at Gastein. The mean annual summer temperature is about 56°. The following diseases are benefited: locomotor ataxy, impotency, hypochondriasis and hysteria, cerebral irritability and excitement, paralysis, and especially the debility or natural decay of old age. The climate is unsuited to asthmatics or delicate poitrinaires.

In the district of Gastein are other similar springs.

Tobelbad is romantically situated in the Gratz country, at an elevation of 3,350 feet. The waters are warm.

Romerbad and Tüffer, 950 feet above the sea, have a good climate, and are situated on the line from Trieste to Vienna, in Styria.

Sulphur Baths.—The sulphur baths are: the cold springs of Innichen, at an elevation of 4,000 feet, near Toblach, and the hot ones of Ofen, near Buda.

Baden, near Vienna, is one of the principal baths of Europe, and has a large swimming-bath where the sexes bathe together. The temperature of the waters is 95°.

Mehadia, in the Banat, has sulphur waters and a good climate. It is near Orsov on the Danube.

Purgative Waters.—The purgative waters are those of Carlsbad, Marienbad and Franzensbad in Bohemia, Rohitsch in Styria, Pullna and Hunyadi Ofen.

Carlsbad is situated in Bohemia, at an elevation of 1,200 feet, in a deep valley in the midst of a well-wooded country. It is on the railway, and is the most celebrated purgative spring in Europe. The season is from June to the end of September. The summer heat is generally intense, but changes often occur. May is rather a pleasant month.

The waters are hot and remarkably powerful. The main ingredients in the numerous springs, which only differ in temperature, are: sulphate of soda (20 grs. to 16 oz.), sulphate of potash (9 grs.), chloride of sodium (8 grs.), carbonate of lime (2 grs.), and a little carbonate of soda and iron, and phosphates of alumina and silica. The principal springs are the Sprudel, the Schlossbrunnen, the Mühlbrunnen, and the Marktbrunnen. The Sprudel spouts up to the height of several feet, emitting clouds of vapour. The temperature varies from 165° (Sprudel) to 125° (Schlossbrunnen). The waters are used principally for drinking, morning and evening, the dose being from one glass to ten, according to effect.

The diseases relieved are: enlarged and fatty livers, gall stones, diabetes, gout and rheumatism, congestion of the uterus, portal plethora and lithiasis. When hepatic heaviness is combined with a tendency to diarrhœa and dysentery, as is often the case with returned tropicals, these waters should be used with great circumspection, or Vichy or Vittel recommended instead. Peat baths are also to be had.

The acidulous table-waters of Otto's cave, close by, where there is a hydropathic establishment, are largely exported.

Marienbad is about five miles from Carlsbad, and is situated in an open but beautifully wooded country, at an elevation of about 2,000 feet. Its waters differ from Carlsbad in their much greater purgative strength, in their higher percentage of carbonic acid, and that they are cold and contain

sufficient iron to exercise a chalybeate effect. These waters are used in similar diseases to those of Carlsbad, except diabetes. The great speciality is the cure of obesity. Peat and carbonic acid gas baths are also available. The former are useful in chronic ulcers and glandular swellings, while the latter are beneficial in neuralgia, nervous excitement, and uterine torpidity. Marienbad is a pleasant place, and there are a good many English.

Franzensbad is ninety-two miles west from Prague, and possesses cold purgative saline and chalybeate acidulous waters. They are valuable in chlorosis, anæmia, and in relieving uterine congestion, for while tonic they are gently purgative. There ar also peat baths.

Rohitsch, near Cilli, in Styria, has a fine climate, and its waters are largely exported for the cure of dyspepsia.

None of the purgative waters we have been discussing contain sulphate magnesia, in which respect they differ from the more powerful springs of Pullna, Friedrichshall, Hunyadi Ofen, and Franz-Joseph, whose waters are exported, and are of great value in habitual constipation, when they may often be taken with safety for years.

The iron springs of Königswart are near Marienbad, at an elevation of 2,300 feet. They contain much carbonic acid, and there are baths.

Health Resorts.

Meran, in the Tyrol, is celebrated not only for its grape cure in autumn, but also as a winter resort from November till the end of February; during which period it is much patronized by German poitrinaires. The spring season, with whey and koumiss and goats' milk cures, extends from April to the 15th of July. Besides, at all seasons there is the cure by medicated baths, and the treatment by *variations of air pressure in the pneumatic chamber*.

Meran is situated in a charming district on the southern slopes of the Alps, with an elevation of 1,050 feet, and is

well protected on all sides except the south, where it is fully exposed to the sunny valley of the Adige, and to south winds, which sometimes blow with great strength. The climate is remarkably dry, with only 52 wet days in the year, and 13 in winter, and a mean humidity of 67, January being 80. The mean winter temperature is 41°·67, as there are many sunny days. It possesses, then, a cold, dry, well-sheltered, tonic, sunny winter climate. Mist and dust are very rare; but there is a vast difference between the sun and shade temperature, so that while it is freezing in the shade it is pleasant and warm in the sun. It is possible for invalids to sit or walk out on more than three-fourths of the days in winter, and on the sunny balconies of the houses more frequently still. There is a band, and pleasant walks and resting-places abound; good hotels, and boarding-houses are numerous. Patients often go South in spring, as March is an unpleasant time.

Obermair, higher up, is cooler, and a more desirable summer-place than Meran itself. The climate has been found useful in asthma, chronic bronchitis, and emphysema, with the pneumatic chamber; also in chronic phthisis, without cavities or hemorrhagic tendency, and for the neurotic, anæmic, scrofulous, and rheumatic. Old or delicate people with a weak circulation will not do well. It is on the railway from Innspruck to Italy.

Arco is beautifully situated to the north of Lake Garda, and is a bright sunny place, well protected, not only from the northerly but from the south and east winds which blow in March. It is suitable for lung and nervous affections, especially in autumn and spring, but is not so warm as the Riviera in winter. There are inhaling chambers, winter gardens, a casino, and good accommodation.

Abazzia, near Fiume in Dalmatia, is a well-sheltered winter station, and has cheap and good accommodation. It is on the sea, in the midst of beautiful scenery.

CHAPTER VII.

The Climate of Spain—Portugal—Balearic Islands—The Azores—Italy—Sicily—Sardinia — Greece — Turkey — Cyprus — Russia — Roumania—Poland—Norway—Sweden—Denmark and Iceland, with their Health Resorts, Spas, and Prevailing Diseases.

SPAIN.

The climate of Spain varies greatly according to the latitude and elevation. The climate of the central table-lands of Castile and Estremadura, whose elevation is between 2,000 and 3,000 feet, and which are bordered and traversed by high ranges of mountains, is one of great cold, with frosts and strong winds in winter, and extreme heat in summer. Snow seldom lies long unless on the mountains, but skating is common in Madrid in the winter. In summer, on the higher plateaux, the nights are cold, with frost, while the days are dusty and burning. In spring cold mists often occur, and great and sudden changes of temperature are frequent throughout the year. The southern or semi-tropical zone includes Granada, Andalusia, South Murcia, and Alicante. Here the summers are rainless, vegetation ceases, and the heat is intense. The winters are mild, with much rain and active vegetation. The eastern districts are exposed to the levache and solano—the dry and moist siroccos of this country.

The north-west provinces are temperate, mild, and equable, but very damp; the rainfall being constant, but heaviest in autumn. Galicia is exceedingly wet, but well cultivated and very fertile. The central plateaux are healthy, but treacherous, the most common diseases being rapid con-

sumption and acute chest affections, with acute cerebral and chest disorders among children. There is a little dysentery in the summer; but all kinds of fevers, including agues, are rare. The south-west coasts about Seville and Cadiz are humid and aguish, and the prevailing diseases in the south are acute abdominal affections and rheumatism; with leprosy, especially in Granada. On the whole, the climate is pleasant enough to the healthy. Navarre and Arragon in particular have a mild and salubrious atmosphere; but in winter the plateaux and the damp northern parts are decidedly injurious to phthisical and other chest and throat invalids.

Mineral Springs.

Indifferent Springs.—The indifferent springs are Caldas, Oviedo, and Panticosta.

Panticosta, fifty-six miles from Pau, at an elevation of 5,600 feet, is romantically situated in a little green valley in the Pyrenees, surrounded by lofty mountains. The establishment is good, but the place is cramped and shut in. The waters are used for drinking, bathing, and the inhalation of nitrogen. The climate in mid-summer (July and August) is delightful, and the diseases cured or relieved are early phthisis, laryngeal, and stomachic affections and hemoptysis. Advanced phthisis does badly. The waters are hot, and contain sulphur, iron, soda, lime and much nitrogen. There are no English visitors.

The earthy hot springs are Sacedon, a fashionable place near Madrid, used in skin diseases and syphilis, Urberoaga Alzola, not far from San Sebastian, called the Spanish Vichy, and useful in urinary disorders and spinal disease, and Fitero, between Castile, Navarre, and Arragon, frequented for rheumatism, paralysis, and convalescence from fevers. The dust along the roads is said to be balsamic at Fitero.

Sulphur Springs.—There are many Spanish sulphur-baths; the most noted are Santander and Caratraca. The latter is in a beautiful country with a pleasant climate, in

the district of Malaga, and is useful in scrofula and phthisis, and chest diseases. Season, from June to September. The waters are cold.

Amongst other Spanish mineral springs the natural purgative waters of Rubinat-Condal must not be forgotten. The water is largely exported, and is exceedingly rich in Glaubers and Epsom salts. I have found it an effectual laxative, not only for sufferers from gout and torpid liver, but in almost every case where a saline aperient is indicated, including piles. The dose as an aperient is a third or half a tumblerful; as a laxative half the quantity, repeated as required.

Saline Waters.—Cestona, fourteen miles from San Sebastian, in a beautiful country, with good accommodation and boating, has thermal and saline springs, containing, besides common salt and sulphate of lime, enough Glaubers salt to render them purgative. They are useful in digestive and bronchial troubles.

Trillo, fifty miles from Madrid, is a fashionable place, and has weak warm saline waters. Caldas de Montbuy is a strong, very hot saline spring, near Barcelona. Season, from 1st of May till 15th of July, and again from the 1st of September to the 15th of October.

Health Resorts.

Malaga.—There is perhaps no place in Europe that possesses a climate at once so mild, equable, and with so little variation from day to day, as Malaga. The mean annual temperature is 66°·11, that of winter being 53°·4, the heat in January corresponding to May in London. The air is mild, and the force of the wind is lessened by the protecting mountains at the back. The rainfall is about 16 inches, with 40 rainy days. The only drawback is the terral, a cold, harsh, north-west wind, which causes oppression of the chest. Malaga is well suited in winter to early phthisis, and, indeed, also to other phases of this

disease. Supplies are abundant, but there is no accommodation except in hotels in the crowded town.

Valentia is also a large city, built on a plain about *three miles from the sea.* The climate is dry and free from fogs, while the winter winds are soft and mild, and those of summer cool. The mean temperature is 63°, that of winter 49°·7. The mornings and evenings in winter are crisp. The best time is from the middle of February till the middle of July. Autumn is feverish, and should be avoided.

Besides consumption, the climate is useful in rheumatism, albuminuria, and stone in the bladder.

Seville has a mild but tonic climate. The best time is from November till March. October, November, and April are wet. In summer the sultry east wind gives rise to fevers, irritability, and neuralgic affections.

Aranjuez, near Madrid, has a soft and mild climate in April and May.

Barcelona is partially protected from the north winds, and the winter climate is mild. Mean winter temperature is 50°·18. There are 69 wet days in the year. Useful where a stimulating dry climate is required.

In *Madrid* the winters are long, raw, and treacherous, and the summers hot and oppressive.

Alicante has a climate similar to Barcelona.

Gibraltar has a mean winter temperature of 57°·9. Owing to the prevalence of the levante the winters are apt to be cold, rainy, and unpleasant. The rainfall is 43 inches. It is not to be recommended to invalids.

Huelva, four hours from Seville, has a warm and very equable climate, and a fair hotel.

Seaside Places.

The principal are San Sebastian, Deva, Motrico, and Sardiniero, all on the north coast. At San Sebastian everything is on a grand scale, and there is good bathing, a large casino, good lodgings and hotels, and fine scenery.

BALEARIC ISLANDS.

The north-western chain, rising to the height of 4,000 feet, protects the south-eastern level parts of Majorca from the cold winds and gales to which these islands are exposed. The summer heat is modified by the sea breeze. In this favourable part is Palma, the principal town, which possesses a mild and equable winter climate, and one that is well suited to poitrinaires. There is hotel accommodation. Mahon is the chief town of Minorca, but it is not suited to invalids. Iviça has also a mild, equable climate, with occasionally hot winds.

PORTUGAL.

Lat. 36° 56′ and 42° N. The climate is warm, moist, and very equable, owing to its latitude, its proximity to the ocean, and the heavy rainfall. As much as 190 and 200 inches have been known to fall in the year, which, as it is not torrential, but distributed throughout the year, increases the dampness and naturally heightens the discomfort. Fogs are also common.

The average mean temperature of Lisbon, Coimbra, and Oporto is respectively 61°·3, 61°·1, and 60°·2. The mean of January is 50°·2 and of July about 70° at Coimbra and Oporto, while it varies at Lisbon from 38° in January to 90° in July.

In the highlands of Beira, Estremadura, Cintra, and Coimbra the climate is cool and even cold in winter. In the deep inland valleys the summer heat is intense, but, unless in the district of Alemtejo, the country is not malarious or unhealthy. Portugal was formerly very fashionable as a winter health resort, and, though we cannot recommend it to consumptives, the climate is well suited to irritable throat and chest disorders, and other diseases suited to a moist, warm climate, and some cases of fibroid phthisis.

There are hot alkaline sulphur springs at Caldas da Rainha, near Lisbon, at Pedro del Sul, and at Caldas, near Oporto.

AZORES.

These islands form an undulating table-land, dominated by higher peaks, some of which are 9,000 feet above the sea. The climate is very warm and equable, but too damp, and in winter storms are frequent, so that landing may be difficult, or even dangerous.

On St. Michael's there are many hot springs. The population of the principal town, Ponte Delgado, is 15,000. These islands may be visited for pleasure, but they are unsuited to tubercular consumption. I found them in winter cheerless and wet. I cannot recommend them to invalids.

ITALY.

The isothermal line of 59° Fah., or 15 Cent., which limits the warm zone and here follows the course of the North Apennines, divides the climate of Italy into the north, or continental variety, and into the central and south, or maritime type. The temperature of the east side of the descending Apennines is lower than the west by about 10° in winter. The climate of North Italy is very cold in winter and hot in summer, and at Turin, owing to its inland situation and to the hot winds being shut off by the Apennines, the winter cold is greater than at Copenhagen.

The climate of Central Italy is greatly affected by elevation and proximity to the mountains. West Tuscany and the west country thence to Rome have a mild winter climate, except the upland valleys, which are very cold, snow commencing in the Abruzzi and Sannio in November and continuing till May. On the coasts in this region oranges thrive in winter.

Around Naples snow and frost are very rare, but in the valley of Avellino, twenty miles inland and of no great height, light frost may be seen in June. In the extreme south the heat on the coast lands is sub-tropical, but in the hills it is temperate.

The seasons are regular. The spring is generally calm and serene; the summer hot and dry, with the Etesian cloud-scattering winds in July; autumn is stormy and rainy. Strong north winds usher in the frost and cool weather, and with the onset of winter the Boreas, or north-east winds, appear. Over the whole country south-west winds prevail. Tuscany is the wettest part. The sirocco is oppressive in the south.

Salubrity.—A most important feature is the prevalence of marshes from Pæstum, through the Pontine marshes and the Campagna, to the Tuscan Maremma.

Notwithstanding the marshes, Italy, on the whole, is a healthy country. The atmosphere is clear and transparent, and without any great variations. Malarious fevers are common along the western coast, except at Gaeta, and some few other elevated places. These diseases are common and frequently fatal at Rome, particularly in July, August, and September. August is the worst month of all, when the well-to-do people frequently sojourn at Gaeta, Naples, or Florence.

The fevers are rarely continued, but remittents are common enough. Of intermittents the tertian is more frequent than the quotidian: the quartan being rare even in autumn. The pernicious type is not by any means infrequent—the delirious ataxic and comatose sub-varieties being common.

Fluxes and typhoid come next to malarial fevers in frequency during the hot season at Rome; and acute chest affections are common in winter, but more frequent in the hilly interior. On the east coast inflammations predominate; fevers being rare. In the Plain of the Po pellagra, owing to unsuitable food, and fevers in consequence of wet rice cultivation, are common diseases. Pellagra is not confined to North Italy, but extends to Provence, Savoy, and other parts of France. Consumption is very rare in Calabria and Liguria, but it has greatly increased at San Remo, since this town became a health resort.

Mineral Springs

Earthy Waters.—The baths of Bormio are on the Italian side of the Stelvio route, at an elevation of 4,400 feet, surrounded by magnificent scenery. They have been called 'the paradise of the ladies,' and have a great reputation in sterility, rheumatism, hysteria, and splenic and malarial affections. The temperature of the waters is from 86° to 104°. Bormio is bare, but sheltered from the north and east, and has a mild climate, May being the best month for bathing. It is well suited for the Alpine cure of consumption. There is a whey cure. Courmayeur is close by, with slightly purgative earthy waters. It is a charming place, useful in bronchial, scrofulous, skin and bladder affections.

Sulphur Springs.—Hot sulphur springs are found at Acqui, Valdieri, and Abano. Acqui is near Alessandria, in Piedmont, and the speciality is the local application of poultices formed of the soft, muddy substance from the bottom of the wells. There are also regular mud baths. Abano is near Padua, and has mud applications. Battaglia is close by, and has vapour baths and good accommodation. These places are very hot in summer.

Valdieri is in the Alps, at an elevation of 4,000 feet. It is fifteen miles from the railway at Cuneo, thence by carriage and horseback. It is pleasant from June till the end of August, and there is good accommodation. Besides the sulphur baths, the slime from the wells, composed of the low animal life that flourishes in the waters, is applied at a very high temperature. Skin diseases, scrofula, and rheumatism are attended to.

Saline Springs.—Some of those in the vicinity of Naples are Ischia, Castellamare, and Pozzuoli. They are alkalo-saline in constitution, containing common salt, carbonate of soda, and carbonic acid. Castellamare is warm, the others are hot. The island of Ischia is cooler than the mainland in summer, the waters being abundant and scenery delightful; it is an agreeable place to sojourn.

Other waters of this description are found at Solfatara, where the stufe of Nero still exist, and at Porretta, at an elevation of 1,000 feet, near Bologna. Monte Catini, near Lucca, has hot waters with a little iodine, which are very useful in dysentery, hepatic, and splenic enlargements and ague. There is good accommodation. The grotto of Monsumanno is close by, and is utilized as a hot-air bath in rheumatism.

Health Resorts.

Rome has a mild, dampish, winter climate, which is very sedative. It is well suited for chronic bronchitis, asthma, and chronic chest affections. Though there are many wet, cutting, cold and windy days, the vast majority are bright and sunny. December is cold and wet, March and April very fine, and October fine. It is, on the whole, wetter, colder, and the north winds are more trying than on the Riviera. The Roman fever is generally caused by fatigue, and chill, and want of ordinary care and precaution. It is not very dangerous. Delicate children do well for a couple of winters. The temperature is 8° higher than London.

Naples has a pleasant climate during December, January, and February. Changes are rapid and trying, and the sanitation is not good.

Florence is not suited to invalids, but is good winter residence for the healthy.

Venice is mild and rather relaxing, and is useful when those conditions are required.

Gardone Riviera is a well-sheltered and sunny station on Lake Garda, with a climate like Montreux.

Pisa is dull, gloomy, and sedative.

Porto d'Anzio has a good spring and winter climate.

The climate of the cities of *Lombardy* and *Piedmont* is harsh and changeable, and not to be recommended to invalids, and the climate of *Lago Maggiore* and *Como* are unsuitable to poitrinaires in winter. Even in summer the Lago Maggiore stations are too cold, dewy, and changeable.

The best summer places for ordinary invalids on the Lake of Como are *Balbianino*, *Torreo*, and *Bellagio*, and *Varenna* for consumptives. The Lake of Como is well suited to consumptives in summer, and Pallanza and Locarno in spring.

Pozzuoli, *Castellamare*, and *Capri* are good winter resorts, but *Ischia* is too exposed for poitrinaires.

The bathing stations are Leghorn, Spezia, San Remo, Venice, Naples. Viareggio, near Leghorn, is both a winter and summer station.

SICILY.

The climate is greatly influenced by the mountain range which runs close to the north coast from Messina to Trapani. From this range the land slopes towards the south, at an elevation of from 2,000 to 500 feet. This range modifies the sirocco in the north. The climate is, on the whole, warm and equable, the range between the hottest and the coldest months being similar to England. The rainfall is 30 inches, falling mostly in winter, and frost and snow do not occur unless on the mountains. The sirocco, which carries volumes of red dust, is the drawback of the country. It generally lasts a couple of days at a stretch, and, though most frequent in April, May, and September, no month entirely escapes.

On the east coast, where Messina and Catania are situated, a moist, hot sirocco also occurs. Malarial fevers are common enough, but the east coast from Catania to Messina is free, and also the line from Palermo to Termini. It has been found that while the lowlands are free, the elevated country from Termini to Girgenti and from Catania to Castro Giovanni is very subject to fevers, while Leonforte, 3,000 feet high, is so dangerous that the railway servants are obliged to leave it at night.

Palermo is of all winter stations the most lovely. The climate in winter is warm but damp, with 21 inches of rain and 131 rainy days. It is exposed in the north, and occa-

sionally gets a touch of the exhausting sirocco. The soil in parts is damp, and the glare of the sun somewhat trying to the eyes. The mean temperature of January is 51° and of July 77°. Those who find the Riviera too stimulating or sharp, and Madeira too relaxing, will probably do well at Palermo, as will cases of irritative consumption, some cases of spasmodic asthma, and when there is a tendency to blood-spitting. The Hôtel de France can be recommended.

Catania and Aci Reale will afford an agreeable change from Palermo.

Aci Reale is a bare, dull place, noted for its baths, hydros, hotels, and good winter climate. It is near Catania. Rheumatism, bronchitis, and phthisis are attended to.

SARDINIA.

In this mountainous island the summers are intensely dry and hot, the mean being 95°. This is the unhealthy season, ague being prevalent in the deep valleys. The winter is the wet season. Autumn is said to be warm, equable, pleasant, and healthy. Cagliari, on the south coast, is the chief town.

GREECE.

The climate of Greece is characterized by immense variations, owing to rapid passage from lowland to mountain all over the country. Allowing for the elevation and low latitude, the summers are everywhere remarkably hot, and the winters very severe, owing to the sirocco and cold winds from the frozen plains and mountains to the north.

At Athens, in Attica, the wet days number 25 only, and the mean temperature is 64°. January and February are the coldest months, yet the corn is high in March and cut in May (Schmidt). Attica is the driest, while Bœotia, though close, is the wettest district.

There are but two well-marked seasons—winter and summer, the latter lasting from May till the end of September. The mean temperature at the Piræus is, May 29°,

June 32°, July, August, and September 30°, and November 28° Cent. The latter three months are very dry. The winds are north and south, and the Etesians temper the great heat in August and July. Rainy winds blow in January.

Salubrity.—Owing to the marshes, bad drainage, and number of hills and valleys, paludal fevers are very common and sometimes severe, but, as a rule, they are easy to cure. Dysentery, sometimes with hepatitis, occasionally occurs. Jaundice of a mild form is common, especially in September, and typhoid fever complicated with mumps, gangrene, and buccal and intestinal hemorrhage, is not infrequent. Acute chest diseases are remarkably rare, except in February and March. Laryngitis and stridulous croup are often observed. True croup is rare, and phthisis is also remarkably rare—less, however, owing to the climate than to the care which is universally taken to avoid marriage into families suspected of this fatal disease, which is looked upon as both hereditary and highly contagious.

It is not, however, I think, an uncommon disease among Greeks, as I have myself treated several people of that nationality in London. On the whole, the east side is dry, hot, and salubrious, the sky being clear, and the air bright and exhilarating. The west coast is damper and milder, with storms and north winds in winter, and warm springs and dry hot summers.

The climate of the *Ionian Islands*, formerly belonging to Britain, is very similar. The capital is Corfu, with 16,000 inhabitants, at one time recommended for consumptives. It is, however, too wet in winter, and poitrinaires, who may wish to winter in Greece, should select a non-malarious place on the eastern coast and remain there. Athens being dry, might answer the purpose. I do not, however, recommend Greece to invalids.

TURKEY.

The climate of Turkey, including the provinces of Bulgaria and Bosnia, varies greatly. The plateau of the Balkans is very cold in winter and very hot in summer. Snow covers the ground for seven months. Icy winds blow over most of the country in winter, except Albania. At Constantinople, while the mean summer heat is between 25° and 27° Cent., the winter temperature is often as low as −7° Cent. in the day, falling to −15° at night. South winds from Syria and Africa fall on the south coasts of Turkey, hot, heavy, foggy, and unhealthy. The dryness increases as we go from the Adriatic towards the Black Sea. The summers are generally dry, pure, and serene, but storms sometimes occur towards the Black Sea coast. Spring is the most pleasant season, yet the summer is rarely unpleasant for any length of time, as the heat is tempered by the cool dry northerly winds. Autumn is the season of storms and rains, and snow falls over the Danube about the 15th of November, and lies till March.

The prevailing diseases are malarial fevers, which, though common at Constantinople, are less frequent and grave than at Galatz, Braila and other parts on the Danube. Typhoid fever is common in the capital, but less so in the northern provinces. Dysentery, often complicated with hepatitis, is both grave and frequent, particularly towards the end of the summer. Small-pox causes the heaviest mortality after dysentery. Respiratory diseases are common from November to May. Bronchitis often occurs, and pneumonia following, or complicating fevers, is a fatal disease. Pleurisy with effusion is very common, and phthisis is both frequent and rapid at Constantinople.

Blood-spitting often attacks non-phthisical people; and croup, whooping cough, diphtheria, and convulsions, are very fatal among children. Uterine and ovarian complaints are frequent. Cretinism and goitre occur in the

hills. Leprosy, elephantiasis, and the ulcer of Aleppo are not uncommon.

Cyprus is very healthy for Europeans, the heat of the lowlands being tempered both by the sea-breezes and those of the extensive interior uplands. Fevers are rare and mild.

RUSSIA IN EUROPE.

Russia is throughout its whole extent, through 26° of lat., a level country, its vast plains resembling in some degree the deserts of Asia and Africa. There are dry elevated tracts called *steppes* in the south, one of which, near the Sea of Azov, is 400 miles long. The rivers, forests, and canals, are large and numerous.

Though there is considerable variation, yet the climate, considering the extent of country, is more uniform than any other region in Europe. There is no place in Russia, from Archangel to Odessa, where the temperature is not 86° in summer, and as low as – 13° to – 22° in winter, and nowhere, unless along the Black Sea, is the absolute range as low as 108°, while the usual range is from 126° to 144°. Excluding Finland, Poland, the Caspian region, and the Caucasus, the rainfall averages from 16 to 28 inches. The heaviest rainfall, unlike what appertains in Western Europe, is in summer. By this means the heat is moderated, and the aridity of the land prevented. Spring sets in suddenly, with great heat, and in autumn the cold sets in rapidly. The winters are long, and the frost continues from November till April in the south, and till May in the north. There is a short bout of cold weather about the 18th of May, and in June the hot short summer finally sets in.

The valleys of the Caucasus are warm, and the coasts of the Crimea are covered with verdure, and even at Astrakhan the vine flourishes. These are the mildest parts of the country. The relative humidity varies from 80 to 85 per cent. in the north, and from 70 to 80 per cent. in the south and east. The wind blows strongly, and on the steppes,

which are subject to heavy gales, the humidity is but 60 per cent.

The rainfall varies greatly, being 18 inches at St. Petersburg, 23 inches at Moscow, 15 inches at Odessa, 15 inches in the Crimea, 61 inches at Poti, and 19 at Tiflis. The cloud range also varies from 75 per cent. in the north, where the weather is often misty, to 65 per cent. in the centre, and 53 per cent. in the south.

The *tundras* lie along the north coasts, and are due to the want of drainage and snow. They are covered with lichen, moss, and short birch. The steppes cover all South Russia, and are divided into the ante-steppe, the intermediate, and the steppe proper. The two former are a mixture of forest and steppe, where the climate approaches the European type, and lie between the isotherm of 59° and 63°. South of this, and towards the sea, is the steppe proper, a fertile, elevated, slightly undulating, but apparently flat plain, intersected by numerous ravines.

The steppes are remarkably healthy, and the spring vegetation luxuriant, and there is great freedom from consumption. The climate of the extreme north and Lapland is Arctic, while that of St. Petersburg is unpleasant and unfavourable to consumption and chest diseases, both on account of the extreme cold and the number of misty days. The climate of the central and western parts, and particularly of the steppes, is clear and bright, but very cold in winter. Yet, as the better class of houses are comfortably heated with hot air, the winters are not disagreeable, and I have known an old winter cough to be entirely got rid of during a winter at Moscow.

Diseases.—The mortality, on account of the poverty and backward state of the people, is 3·7 per cent.—much higher than any other European country. The most common diseases are pneumonia, rheumatism, diseases of the throat, scurvy, typhus, and pleurisy. Phthisis, unless among the military and in the Baltic provinces, is rarer than in Western Europe. Intermittents are often said to be un-

known beyond the 65th parallel, or that of St. Petersburg, but, as a matter of fact, they are common in the marshes of Finland and at Cronstadt, and in the capital itself. Guinea worm also occurs in the marshes of the Neva, and scrofula and leprosy are not unknown in the Baltic provinces.

In the western provinces, summer is the healthiest season. Chest affections and catarrhal fevers occur in the winter, and dysentery, diarrhœa and cholera in the fall. In the extreme north the most common diseases are hæmorrhoids, bone and skin diseases, eruptive fevers and ophthalmia, caused by the snow and the smoke of the huts. Arctic hysteria is also often observed.

On entering the Caucasus from Russia, the first station is the 'Baths.' The station is formed of a collection of Cossack huts and good hotels. The springs lie amid a group of volcanic hills, which break the rolling steppe, and are dominated by the lofty dome of Elburz, 18,000 feet above the sea. The *Patygosk* springs are sulphurous, and the *Nargau* a sparkling chalybeate. They are well attended by the merchant and official Russian classes.

The climate of Roumania and Poland is similar to that of South-western Russia.

NORWAY.

Norway is one of the most mountainous countries in the world, and the Dofrefeld range, which runs along the western coast, expands into extensive plateaux and dreary wastes, from which at intervals rise peaks to the height of 7,000 or 8,000 feet.

The climate varies greatly, that of the west coast being mild and extremely humid, while to the east of the mountain range the climate is generally cold and dry in winter, and hot in summer .The extremes of no part of the country are so great as in Sweden. On the west coast it rains for whole days at a stretch, and the mountains are covered with mists. At Bergen the rainfall is 2,250 milli-

mètres, while at the other side of the mountains it is only 540 millimètres.

In the more northerly parts the sun for some weeks at midsummer never sets, and in midwinter, without rising, shows only a faint light along the horizon for about an hour at noon. During the long winter nights the moon remains above the horizon for several revolutions. The aurora also adds greatly to the brightness of the winter nights.

Norway is a healthy country. Leprosy, unknown in most northern countries, is not an uncommon disease. Chest affections and phthisis are the most common diseases. Fevers are very rare, and leprosy is steadily decreasing.

SWEDEN.

Except towards the frontier of Norway, Sweden is a flat country, with many fertile plains and valleys, and numerous rivers flowing towards the east coast. There are also very many lakes. The climate is less extreme than that of Russia, and less equable and mild than that of Norway. Cold winters often follow mild ones, and cool wet summers succeed to those that are dry and hot. Only about one-twentieth of the soil is cultivated.

The mean annual temperature varies from 44° at Lund, Calmar, Carlscrona, Stockholm and Gothenburg, and Gothland generally to 41° at Nykoping, Askusund and Skara. The mean of January at Stockholm is 16°, and of the summer 62°. The daily range is only 2°, and in the north there is no difference. The rainfall varies from 12 inches at Calmar to 30 inches at Gothenburg.

Sweden is a healthy country, and the summers are very agreeable.

DENMARK.

Denmark is a level country, and the coasts, though sandy and low-lying, are yet generally of sufficient elevation to protect the country from floods, and the interior, though flat, is well-wooded, pleasant, and diversified. The mean

annual temperature at Copenhagen is 47°, that of winter 32°, spring 43°, summer 60°, and autumn 49°. Snow falls on 30 days; wind and rainy storms are frequent, and westerly winds predominate over easterly ones. The cold, dry winds of May and June are often destructive to the crops. The seasons, especially on the west coast, are subject to rapid changes. The winters are wet and misty, with snow; spring is sleety and windy; summer lasts two and a half months, during which and the early autumn the weather is delightful. The climate is on the whole variable, but more temperate than the latitude would indicate. Denmark is a healthy country, chest affections and consumption being the most prevalent diseases.

ICELAND.

This island, so well known for its immunity from consumption, lies between 63½° and 66½° north latitude. The population is scanty, and the people are engaged in pastoral and piscatorial occupations, and at night generally live in huts devoid of ventilation. The whole central plateau is one wild waste of lava and volcanic sand, attaining an altitudinal range varying from 1,500 to 2,000 feet high, culminating occasionally in volcanic peaks nowhere exceeding 6,000 feet, and covered, at all heights above 2,700 to 3,000 feet, with perpetual snow and ice. A high range of ice-clad hills stretching across the island serves to refrigerate the *moisture-laden winds from the south-west*, and consequently produce two distinct climates; the northern described as dry, not so cold in winter or hot in summer as the southern, which is wet and subject to great annual and diurnal variations.

The climate of Reikjavik, the capital, is said to undergo extreme and sudden changes, both of temperature and moisture, though the atmosphere throughout the whole country is generally clear, exhilarating, and appetizing, with a heavy balance of mist and damp in favour of the region south of the central glacial range.

The country is remarkable for its mountains, its volcanoes, and beds of living sulphur, which are scattered at intervals over a considerable part of its surface. Iceland moss is the only vegetable product that, on account of its well-known therapeutic value in affections of the organs of respiration, need occupy our attention.

The oil of the liver of the cod as well as that of the shark are frequently indulged in, and are believed by many sufficient of themselves, not only for the prevention of consumption, but for arrest and eradication of venereal affections as well. The people also drink largely of curdled, sheep's, sour, and other species of milk, as well as whey, the good effect of which on consumption must also be taken into account in explaining the immunity from this disease which the people enjoy.

To sum up, there can be no doubt that the dietary of the people is on the whole strongly conducive to freedom from consumption, and the same may be said also of the influence of the mountain moss in conjunction with the nomadic life incident to its collection. Above all, we must not forget the superficial sulphurous exhalations and volcanic character of the land, which seems to be inseparably allied with immunity from tuberculosis.

But, whether with regard to Iceland, Spitzbergen, the steppes of Tartary, or any other of the Arctic or sub-Arctic regions, whose inhabitants are free from tuberculosis, the character of the climate is not, in my opinion, of the first importance. The *sine quâ non*, the one predominant feature common to all these countries, is that of a scanty population, not collected in towns or crowded places, but dispersed as nomads, as fishers, or husbandmen, over the face of the land, constantly exposed to the elements, and breathing, except perhaps during short intervals, a pure air, and an air free from tubercular germs, the accumulation and development of which are, by such conditions as we have been describing, entirely prevented. Thus it will appear that the climate which, under the circumstances, permits

the freest ventilation and the greatest amount of outdoor exercise is for each individual the best.

The short summers in Iceland are charming, but there appears to be no accommodation for invalids. It cannot be recommended in winter.

CHAPTER VIII.

Tropical Asia—Red Sea—Arabia—India—Ceylon—Hindoo-China: Their salubrity, prevailing diseases, and hill sanitaria.

TROPICAL ASIA.

A GLANCE at the map will show us that tropical Asia is mainly made up of three great peninsulas—Arabia, India, and Hindoo-China. The climate of all, owing to latitudinal influence, is one of great heat.

The main feature of Arabia is intense heat and dryness, of India great heat and a varying degree of moisture, and of Hindoo-China, which extends close to the equator, great heat and moisture. Of the three India is the most salubrious for Europeans. As latitude, then, is not the sole influence in producing these climatic diversities, they must evidently be due in part to other causes. Amongst these are the relief of the land, the size of the seas, the height of the mountain ranges which bound them on the north, and the characters of the neighbouring countries.

The intense heat and dryness of Arabia, which, after a brief description of the Red Sea climates, will first occupy our attention, is due to its proximity to the great desert of Africa, the hot winds from which have converted the country, with the exception of the hilly districts of Yemen and Oman, into deserts more desolate, if possible, than the Great Sahara itself.

RED SEA SHORES.

The Red Sea shores, extending from about the 30th to about the 11th degree of north lat., are, owing to the

powerful sun, the cloudless sky, and the barren coasts, one of the hottest regions in the world. The average mean temperature is from 70° to 94°, sometimes reaching 105° Fah., even on board ship, in the shade. In the north, towards Suez, the clear air, by producing evaporation, so lowers the temperature that it may freeze on shore at night, and the cold land winds are specially to be dreaded by invalids approaching from the tropics by sea. It was here, on returning from India convalescent from hepatic abscess, that, owing to an open port-hole, I contracted hepatic congestion and pneumonia, that placed me *hors de combat* for months. Over the land the air is dry, the difference between the wet and dry bulbs being as much as 40°. Over the sea in the summer the air is often saturated with moisture, as is also often the case on shore when the sea winds blow.

Rain rarely falls on the coasts, but frequently on the Abyssinian and other mountains at a distance. The prevailing winds are N.N.W. throughout the year on the shores, and on the sea from June till September, also from October till May in the northern half. Southerly winds blow over the south in autumn, while over the centre there is a belt of comparative calms. Hurricanes seldom appear. Toward the south the sea temperature is in excess of the air, the mean being 89° Fah.

Sunstroke may occur on board ship when the air is close. The changes on the coasts are enormous and sudden, and at Massowah the variations are between 62° and 122°.

ARABIA.

The climate is hot, dry, and along the coasts very unhealthy; but the rains which fall in winter and spring in the Nesjed and Yemen highlands increase the fertility and cool the climate of these parts. While the simoon rages, which it often does for forty days together, the heat of Arabia is deadly. The *Shamiel* wind from the south is the scourge to be dreaded. Dysentery, fever, and cholera suc-

ceed each other continually, and are very fatal during the arrival of the immense number of pilgrims who visit the tomb of Mahomed, one-third of whom, owing to dirt, over-crowding, and privation, are said to be carried away.

The temperature of the highlands seldom rises above 90° in summer, and at Sana, with 40,000 inhabitants and 4,000 feet above the sea, it does not reach 85°. Snow falls occasionally, and frost is common in winter. The plateau of Nejd is also endowed with a healthy and agreeable climate. The air, being at once pure, of moderate temperature, and not possessing sufficient moisture to facilitate vegetable growth, is, as is also that of Yemen, admirably adapted as a winter climate for consumptives. The maximum degree of heat is found at Tehama, on the Red Sea, the thermometer never falling below 80°. The shores of the Persian Gulf are also extremely hot, while, owing to the rocky nature of both shores, the air is full of moisture. The coast districts and towns, except Hodeida, the port of Sana, are very unhealthy for Europeans. Hail and Riad, at an elevation of 3,500 feet in the interior, have a good climate. The port of Muscat is very hot and unhealthy. Aden is in the rainless region, rain falling once only every two or three years. Though very bare, dry, burning, and cheerless for Europeans, Aden is not an unhealthy place, and Steamer Point is exposed to the fresh sea-breezes.

The sea-coast regions of South Persia and Beloochistan are deserts of moving sand, with scanty vegetation and little rain. They are exposed to a burning sun and blasting wind, and their climate and prevailing diseases are similar to the Arabian coasts. All the Gulf ports, the islands, and the banks of the Euphrates up to Mesopotamia are subject to severe and fatal fevers.

The prevailing diseases in the interior of Arabia are ophthalmia and various affections of the skin, other diseases being rare. Along the marshy and boggy coasts, especially of Hedjaz and Yemen, endemic fever prevails. The coast towns, Djedda, Yembo, Emed, and Cinfunda, are very un-

healthy for Europeans, fever, dysentery, and hepatitis being especially rife. Boils, dyspepsia, bronchitis, and rheumatism are common, owing to the damp nights and sudden changes. Hepatitis is generally confined to Europeans. The ulcer of Yemen, which, however, does not attack Europeans, reduces the Arab army in three years from 4,000 to 1,200 men (Rochard). Scurvy and skin diseases are common among the natives.

INDIA.

The climate of India mainly depends on the latitude, the Himalayas, the Deccan, or central elevated region with its surrounding ranges; the western mountains, the north-western desert, and the surrounding seas.

The latitude being almost entirely within the tropics, the climate is tempered in the south and centre by the elevation of the land, and the moderate elevation of the Western Ghats, which but partially intercept the summer rains. On the northern plains the summer heat is intensified by the Himalayas reflecting the powerful solar rays, and by the hot winds which blow from the burning deserts of the north-west; while in winter the cold is moderated by the northern mountains intercepting the cold winds of Central Asia.

The proximity of the ocean and the relief of the land allow a fair supply of rain to the central plateau, which is lessened by the Salpura Mountains, to be again intensified by contact with the Himalayas. Hence an additional reason why the country south of the Salpura Mountains is cooler in summer than the northern plains fertilized by the Ganges and Indus.

Rainfall.—India stretches out into the belt of the north-east trade-winds, and, were these undeviating in their course, the only rain which this country would receive would be that gathered by them in the Bay of Bengal from October till April, and poured down on Madras during the north-east monsoon. Between May and July the sun shines powerfully on the plains of Central Asia, from which so vast

a current of air ascends, that the resulting vacuum not only completely reverses the course of the north-east trade-winds, but draws and deflects the south-east trade-winds towards India. Thus is the south-west monsoon brought about.

The Ghats,* which cause the rainfall in Bombay, shut it out from Madras. The Deccan receives the superfluous rains from the Ghats, which drain off towards the Bay of Bengal as the rivers Godavery, Palaur, Cauvery, Pennar, and Kistna. Towards the north the Vindhya, the Salpura, and Aravelli ranges condense the clouds borne by the south-west monsoon and flood Surat and Baroach with the Tapti and Nerbudda, and Guzerat and the part of Rajpootana south of the Aravelli Mountains with the Sabermutty and its branches.

The influence of the south-west monsoon reaches the Himalayas and gives rise to the great summer rains, which extend from Africa to the Malay peninsula, and deluges all the intermediate countries within certain latitudes for four months in the year. In South India it begins about the end of May becoming gradually later as it advances towards the north. It is ushered in by vast masses of clouds, terrific thunder and lightning, and fearful blasts of wind.

A little before the storm the sky is clear, the land parched, the air loaded with dust, and the wind scorching, to be succeeded immediately before the bursting of the monsoon by sultry calms. After the first violence of the storm has passed all is changed—the earth is green, the rivers are full, the air is pure, cool, and tranquil, the dread of famine is removed, and exhausted Nature takes a new lease of life. From this time the rains fall at intervals till July, when they reach their acme. They are rather less in the third month, and in September abate. The monsoon diminishes towards the interior, and no trace of it is seen at Candahar, though it is observed in the north-east of Afghanistan when it advances from the east. Commencing with violence on

* The Ghats are the mountain chain which runs close to western coast.

the Malabar coast, it is later and more moderate in Mysore, and felt only as occasional showers on the Coromandel coast. Further north it begins early in June, and is less violent, unless in the vicinity of mountains or the sea. Around Delhi it begins about the end of June, the precipitation being much less than at Bombay or Calcutta. In the north of the Punjaub, near the hills, it is moderate; but in the south of this region, midway between the mountains and the sea, scarcely any rain falls.

The countries of Pukhee and Boonere, under the hills, have also the monsoon, but it diminishes towards the west, being limited at Swat to a month of clouds and tantalizing showers. About the end of July it is felt slightly at Peshawur, Bengush, and Khuttuk. In Bojaur, Punjcora, and Teera, as well as at Janjee, Toree, and Bunnoo, it is heavy. The rainfall from Cape Comorin, on the western side, to Kutch averages 180 inches, a great part of which is again carried off to the sea; the fall at Concan is 70 inches, in the Delhi district 17 inches, at Umballa 30 inches, Loodiana 20 inches, Hushiarpur 30 inches, Jullundur 25 inches, Umritsir 28 inches, Lahore 15 inches, Montgomery, in the Baree Doub, 6 inches. The average annual rainfall at Madras city is 49½ inches. Of this amount 29 inches fall during the north-east monsoon from October to December inclusive, and the other 20 inches during the non-monsoon months throughout the rest of the year. Bombay receives almost all its rain from June to October, the heaviest fall occurring in June, July, and August, the average for those three months being 75 inches. The usual fall at the undermentioned places is as follows: Panchgunner 50 inches, Cherapongee 400 inches, Sylhet 209 inches, and the Khassia hills, north-east of Calcutta, 50 feet. A few degrees west of the Khassia hills rain is almost unknown, and the snow is only a couple of inches. The North-west Provinces receive their monsoon in a secondary manner, viz., when deflected from the north-eastern mountains and the prevailing winds are south-easterly.

In spite of these summer rains a great part of India continues very hot from spring to autumn. After the autumnal equinox the Himalayas become icy cold, and the plains of India cool and even cold. When the north-east monsoon prevails it is everywhere a land wind, except on the Coromandel coast and the Malayan peninsula. In Malaya it blows over a great extent of sea and is very rainy; while on the east coast of Madras it blows over a narrow sea, and is comparatively slight and terminates early.

Extending southward from the Himalayas are the great plains, sloping with a gradual declivity towards the shores of the Arabian and Bengal seas. The plains are divided by a chain of hills and table-lands trending in a south-westerly direction for 350 miles, with an average height of 3,500 feet, presenting a series of summits dazzling with immense masses of red-coloured quartz.

Between the insufferable heat of the plains and the cold of the Himalayan snow-capped mountains the climate is pleasant, and in many places charming and thoroughly enjoyable.

The Northern Circars and the Carnatic, where the summer rains are slight, have the highest mean annual temperature, and the heat often rises to 100°.

In the Deccan, though the summer heat is intense, and the diurnal variation, particularly on the higher plateaux, great, frost never occurs, unless on the mountains; but on the plain of Delhi, five degrees north of the tropic, the winters are cold, and the summer heat intolerable, particularly while the north-west desert winds continue.

The seasons are the cold, the dry-hot, and the wet-hot. The cold includes November, December, January, and part of February; the dry-hot part of February, March, April, and May till the onset of the rains; and the wet-hot occupies the rest of the year.

The cities of India, at least the portions occupied by the natives, are extremely crowded, squalid, filthy, and foul-

smelling—an architectural conglomeration of dilapidated temples, palaces, and miserable dwellings. They are the foci from which cholera, small-pox, and pestilential fevers spread throughout the country and beyond it.

Calcutta and Bengal Proper.

The climate of Calcutta, in latitude 22° 38′ N., is made up of periods of great heat and dryness, followed by periods of extreme heat and moisture, of cold and moisture, and of cold and dryness, interspersed with heavy rains, hurricanes, scorching heat, heavy dews, dense nightly fogs, and sultry calms. The south-west monsoon sets in in June, and the rainfall is 60 inches. From July to mid-October the monsoon is from the south-east, and the air resembles a tainted vapour-bath, when surgical operations do badly, and ulcers become gangrenous. After the cessation of the rains, and the onset of the north-east winds, the air is like that of a damp cellar. After this period it becomes dry and sometimes harsh till February, with nightly damp fogs and dews. The dry, hot season begins in March and lasts till the middle of June, when the shade temperature rises to 95° and that of the sun to 110°. This season, owing to occasional rains and storms, is not as bad as might be expected.

Punjaub.

The climate of this province varies greatly, but the main characteristic, especially towards the west, is heat and dryness. The hottest month is June, when the temperature in a tent, artificially cooled, rises to 112°. From December till March the mid-day heat is between 70° and 80°. For eight months of the year it is temperate, for four months hot and very trying.

The rainfall varies from an inch at Moultan to 10 inches east of the Sutlej. The cold season to the end of February is sharp, and the hills are snow-clad. From mid-May to mid-July the heat is intense, with hot winds from the

desert. The rain falls in August, when it is moist and depressing. The climate is healthy, except for the intermittents, which are very prevalent.

Of other places, Benares has a mean temperature of 78°, and a dew point of 97°, amplitude 29°; rainfall, 37 inches. Cawnpore, mean temperature 84°, amplitude 33°. Meerut, temperature 97°, amplitude 31°; rainfall, 18 inches; elevation 900 feet. Peshawer, temperature 74°; elevation 1,056 feet, amplitude 39°.

May is the hottest and December the coolest month.

Madras Presidency.

Of the Madras stations, Bangalore has one of the best climates in India, with cold mornings and nights, from October till February; strong, dusty winds in March, April, and May, with some showers, the monsoon in June; and damp foggy mornings in January and December. The mean temperature varies from 70° in January to 80° in May. Rainfall, 25 inches. Typhoid fever is prevalent.

Bellary, in latitude 17°, has light dews and no fogs, cool mornings and very hot afternoons; monsoon in June, with 21 inches of rain, and a mean temperature of 80°. The monsoon is preceded by oppressive calms. Climate dry, hot, and healthy.

Cananore, in latitude 11° N., has a mild, equable, agreeable, damp climate, with foggy nights. The shade temperature is rarely above 85°, with hot, close nights in the hot season. Coimbatore has both monsoons, with oppressive weather in September. Cochin is cooled by a daily sea-breeze and a nightly land-wind, which is dangerous on exposure during sleep; climate damp. Cuddapah has a bad climate for Europeans, being very hot and close, even in the wet season. The mean temperature at Kamptee is 80°, with considerable extremes and 41 inches of rain. Fairly good climate with care. Kurnool has a healthy, but very hot climate; Dindigul, very hot, with cool nights.

Madras City, in latitude 13° 4′ N., has a mean tempera-

ture of 82°. January and February are pleasant, the mean being 76°. In March, April, and May there is a southerly, long-shore, disagreeable and unhealthy wind, with a temperature of 85°. From the middle of May till the end of July the land-wind, with a temperature of 88°, continues to blow. In August and September the weather is cloudy, close, and oppressive, with occasional calms, slight rain, and a heat of 84°. During the monsoons, for the rest of the year, the weather is damp, with 30 inches of rain and a temperature of 80°. Madura has sultry days and chilly nights during the monsoon from April to June. Mangalore is relaxing, with a rainfall of 128 inches. Masullipatam has a climate like Madras. Guntore has both monsoons, and is hot from March till June, and cool the rest of the year. The climate of West Mysore is very humid; and at Bednore, elevation 4,000 feet, it rains for nine months out of twelve.

The town of Mysore has rather a cool climate, a temperature of 76°, a rainfall of 30 inches, and nasty high winds from December till April.

Mercara, in the hills of Coorg, has a mean temperature of 67°, and an equable healthy climate, with 120 inches of rain, and a dusty wind in January and February. April and May are pleasant, with hot days and cool nights; monsoon in June, with a temperature of 56° to 65°; November has showers and fogs, followed by clear, cold weather.

Salem has both monsoons. The climate is trying, with great alternations. April and May are very hot and oppressive. Climate bad for Europeans; temperature from 68° to 90°.

The climate of Secunderabad is rather pleasant, with the monsoon from June till October, with 33 inches of rain in the year. The mean temperature is 79°, with a daily range of from 20° to 30°. The winters are very pleasant.

Trichinopoly has a mean temperature of 85°, and is very hot and cloudless from March to July. August is cool and cloudy. From December to end of January the mornings

are cool and the days close. The climate is very trying and hot. Rainfall 30 inches.

Vizianagram is very hot, but healthy, with two monsoons and hot land-winds in April.

Bombay Presidency.

The mean temperature of Bombay City is 80°, the amplitude 12°, and the mean dew point 70°. Poona has an elevation of 1,800 feet, a mean temperature of 79°, an amplitude of 13°, and a dew point of 59°. Belgaum has an elevation of 2,200 feet, a temperature of 74°, an amplitude of 11°, a rainfall of 31 inches, and a dew point of 61°. Nemuch has a mean temperature of 71°, and an amplitude of 29°. Nagpore has a mean of 81°, and an amplitude of 22°. Mhow has an elevation of 1,862 feet, a mean temperature of 77°, and an amplitude of 17°. Hyderabad (Scinde) has a mean of 81°, and an amplitude of 28°. It is a few miles from the river. At Kurrachee the temperature is 78°, the amplitude 26°, the dew point 64°, with a scanty rainfall.

Hill Sanatoria.

In India the hill-stations are tropical and sub-tropical. A sub-tropical group extends from Murree, in the Punjaub, to Almorah, in Kumaon, in about the 30th degree of latitude. They are Murree, Abbotabad, Dalhousie, Dharmsala, Simla, with Dugshai, Subathoo, and Kussowlie, Mussourie, Landour, Almorah, Nynee-Tal, and Darjeeling, due north of Calcutta.

Simla is the leading hill-station in India, and is 77 miles from Umballa. The houses are scattered about on the hill, at an elevation of from 6,500 to 8,000 feet. There is plenty of foliage. The rains begin early in July, when the ravines are misty and unhealthy. Water is scarce in the hot season, and ought to be boiled and filtered.

Kussowlie is 32 miles from Simla, and has an elevation of 6,500 feet. There is no table-land, but the station is well-wooded. The climate is temperate and agreeable, unless during the rains, when it is foggy and depressing.

Subathoo is a bare place, at an elevation of 4,000 feet, and nine miles from Kussowlie, towards Simla. The climate is hotter, drier, and less misty than Kussowlie.

Dugshai is eight miles east of Kussowlie and ten south of Subathoo. It is formed of grassy, timberless hills, and has an elevation of from 5,000 to 6,000 feet. The climate is a good one, but the winter is cold, with snow, and the summer is sometimes oppressive. The rainfall at this station is about 70 inches, mostly in July and August.

Mussourie is close to Landour, and the elevation of the houses, which are scattered about, as at Simla, is from 6,000 to 7,500 feet. To the north tower the snowy mountains, to the south you look down on the beautiful valley of the Doun. January and February are very cold, with frost and snow, and they are succeeded by showers of rain in March and April, from which period, till the monsoon in the middle of June, the climate is settled. The rains, which are heavy, cease in mid-September, and are followed by delightful weather, till early January. The temperature sinks from 64° in October to zero in November. The average mean temperature is 54½°, and the extreme daily range in March is 5½°. It is 20° cooler than the neighbouring stations. It is a healthy station for the fairly strong; but, owing to the want of shade, is less pleasant than Simla.

Darjeeling, though the coolest station in India, is not an agreeable place in the wet season. The elevation varies from 6,500 to 8,000 feet, and the rainfall is about 130 inches. Like Mussourie and Nynee-Tal, and the tropical hill stations, abdominal diseases are very rare. Fevers are also rare; but it is a bad place for the consumptive.

Other hill-stations more or less frequented are *Nynee-Tal*, with a rainfall of 100 inches; *Almorah* and *Harralbagh*, all in Kumaon. The two latter have an elevation respectively of 5,000 and 4,000 feet.

Kunanar is in the Sutlej Valley, at a height of 5,000 feet.

Loohooghat, in Almorah, has a good climate, as has also *Dhamsalah*, in the Punjaub, with a rainfall of 150 inches.

Murree is also in the Punjaub, and has a rainfall of 32 inches.

The following table, from Dr. Balfour's work, shows the mean temperature of the Sub-tropical Hill-Stations:

Names of Stations.	Jan.	Feb.	March.	April.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
Kussowlie	42	47·4	58·7	64·4	77	73·9	79	70	72	66	..	..
Subathoo	..	..	..	77	81	84	79	77	..	..	..	..
Dugshai	42	49	57	64	69	71	72	68	66	62	54	53
Simla	40	44	53·4	61·3	66	80	75	78	70	67·9	52	46
Nynee-Tal	42·2	46·5	56	61·2	69·5	69·6	67	69	65	61	50	47
Landour	35·9	40·7	54·3	..	..	..	..	..	68	64	49	46
Murree	..	..	..	..	..	69·5	68	66	62	62	..	..
Darjeeling	40	41·7	51·8	55	61·9	62·5	63	64	63	55	50	44
Mahableswar*	63·11	64·59	71·82	74·14	71·79	66·8	63	63	64	65	64	63

Madras Hill-Stations.

The hill-stations in Madras are Ootacamond, Kotagherry, Wellington and Coonoor, in the Neilgherrys; the Pullneys, Mercara, Annamallays, Shevaroys, Ramandroog, Chiculda, Sinduarran, and Muthron.

	Mean Temperature Outside in the Shade.													
Names of Stations.	Jan.	Feb.	March.	April.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.	Greatest Height.	Average Rain-fall.
Ootacamond	54	56	60	61	61	57	63	63	63	56	54	53	7360	60
Kotagherry	59	60	61	63	63	64	65	65	64	62	60	59	6100	55
Wellington	59	61	67	68	68	64	70	70	70	63	61	60	5840	50
Coonoor	60	62	68	68	68	65	70	70	70	65	62	62	5161	50
Mercara	53	56	61	64	44	66	65	65	65	63	64	56	4500	100
Shevaroys	65	65	68	71	71	68	68	68	67	66	66	65	5260	40
Ramandroog	70	76	80	80	75	73	71	70	70	71	71	67	3400	46
Chiculda	60	60	70	83	83	71	..	..	..	..	71	71	3600	..

* Mahableswar is a *tropical* station in Bombay, and is here introduced for comparison with the subtropical resorts.

The Neilgherry hills lie between 11° and 12° N. lat. Their summit forms a parallelogram, forty miles from east to west and fifteen from north to south, and they are isolated from the low country on every side, except by a narrow neck of land towards Mysore. Their great elevation, their more tropical latitude, and their isolation render their climate more equable and temperate than the Himalayan stations. The highest temperature is 77°, and the lowest 38°, and the daily range is 17°. January, February, and March are clear and dry, with frosty mornings, and a powerful midday sun. The little rains occur late in March, and April and May are pleasant, with frequent showers and thunder. The south-west monsoon breaks in June, attended at first with heavy rain; but between this and the end of September there are long intervals of delightful dryish weather. October is stormy and windy or fine, according to the advent of the north-east monsoon. November is showery and unpleasant, with fogs. In December the weather is cool and bracing, with morning frost. The seasons are subject to many changes.

Ootacamond, the chief station, is level and fairly open, with grassy fields around, and yet not devoid of sufficient shade. It is a very pleasant place.

Kotagherry affords a pleasant change during the south-west monsoon, which is not felt as at Ooty; and this station, as well as Wellington, is better for those enfeebled by long residence on the plains, or who have suffered from visceral disease. Though not equal to the sub-tropical stations, the climate is a powerful restorative to those who have suffered deterioration of health on the plains, and it is less unsuitable than the northern hills to liver disease, chronic dysentery, and teething children. Consumptives, one would imagine, should do well at Ootacamond, Kotagherry, or Wellington by changing from one to the other, so as to avoid the violence of the south-west monsoon at the former, and the force of the north-east monsoon at the two latter stations. Yet Dr. Fox, of Madras, who has great experi-

ence of these hills, tells me that owing to the air being so rarefied, from elevation and heat, such is not the case.

Ramandroog is thirty-four miles from Bellary, and is situated on a hill-top about a mile square. It is far more healthy and pleasant than its slight elevation would suggest.

The Shevaroy hills are in latitude 11°, midway between the two seas. They have an area of one hundred square miles, are isolated, dry, and afford an admirable residence for those who are unable to stand the greater cold of the Neilgherrys; also for convalescents from dysentery, hepatitis, and sufferers from acute bilious fevers. In all these stations a short sojourn is not of much value, and in comparing their effect with a trip to Europe, the more limited duration of the stay should be discounted in their favour.

The Pullney and Annamallay hills have respectively an elevation of 7,000 and 6,800 feet.

Chindwara is 8° cooler than Kamptee, and Muthron 11°.

Chindwara in Nagpore, and *Chiculda* in the Vindhya hills, are well suited to women and children. Chiculda is a small plateau 4,000 feet above the sea.

In the Maherdragoni hills, at an elevation of 4,000 feet, there are several good sites for stations.

Bombay Presidency.

Mahableswar is the principal station. It lies at an elevation of 4,750 feet, and has a rainfall of 240 inches. The mean of March, April, and May is 73°, of June and October 66°, and for the rest of the year 64°. The wet season is to be avoided.

Mount Aboo is in the Aravellies, at an elevation of 4,000 feet. The rainfall is 79 inches. The temperature of January and February is 61°, March 73°, April, May, and June 77°, rest of the year 69°.

Poorundhur has an elevation of 4,200 feet, and a rainfall of 73 inches, and a temperature about the same as Mount Aboo.

The principal seaside stations are Waltair, on the Madras east coast, Cape Negrais in Burma, and others on the Bombay side.

Salubrity and Diseases.—India, though unsuited as a permanent residence for Europeans, possesses in many parts a climate that will enable them to enjoy good health for six or seven years at a stretch, after which a change to Europe or a prolonged sojourn on the hills is desirable. For a prolonged residence the northern parts are preferable; while, if Europeans could live on the hills from the commencement, they would probably enjoy almost as good health as at home—at least for a long time. Agricultural colonies cannot be formed even on the hills with any chance of success, owing to their limited extent and the active competition of the native population; but as a residence for capitalist planters, overseers, and children that cannot be sent home for education, the hill stations are admirably adapted. As regards actual disease, at least for a time, the healthiest part is the eastern sea-board. Here fevers, dysentery, and hepatitis—the latter so common in the interior and along the western coast of the south—are very rare. The affections of childhood are also rarer than elsewhere. Endemic fevers, so common along the vast plains of the Indus and Ganges, are comparatively infrequent, as they are throughout the southern presidency, with the exception of the deep mountain valleys towards the west. Cholera, endemic in the Gangetic provinces, is only of periodic occurrence in Madras. Beriberi is more frequent in the interior of the south than in the north.

Hepatitis, or, rather, hepatic abscess, is, next to cholera, the most fatal disease in the European army in India; over 13 per cent. of deaths and over 7 per 1,000 of the invaliding being due to this cause. Its predisposing causes, as I pointed out in the *Medical Press* of November 30th, *et seq.*, 1877, are great and continuous heat, excessive eating and drinking, and dysentery, all of which tend to set up congestion of the liver; while the exciting causes are wettings

and chill, inordinate horse exercise, and direct exposure to the sun.

As regards its distribution, hepatic abscess is least frequent in the Punjaub, the North-west Provinces, and Sind, and most frequent in Lower Bengal, Southern India, and Burma. It appears to be most fatal at Cananore, Calicut, St. Thomas' Mount, Bombay, Benares, Barrackpore, and Darjeeling, viz., about 4 per 1,000, and fatal at Thyaetmyo, Mandalay, Tongou, Rangoon, Dum Dum, Allahabad, and Mysore, viz., between 2 and 3 per 1,000. It is essentially a disease of early manhood, occurring almost entirely between twenty-two and thirty-five.

Other prevailing diseases are dysentery, diarrhœa, dyspeptic affections, rheumatism, boils, and prickly heat. Typhoid fever is mainly confined to young Europeans, and especially to those lately arrived in the country, being most frequent in the hot season in Upper India, but being equally distributed throughout the year in Madras. The diseases of children are much more frequent than in Europe, the most common being diseases of digestion, diseases of dentition, convulsions, diarrhœa, dysentery, sunstroke, tetanus, croup, and measles. Scarlatina is rare. Consumption, especially in the dry interior parts of the country, is much less frequent than in England, and young Europeans with a tendency to this disease often do well. Other diseases are leprosy and beriberi, elephantiasis, Guinea worm, the Madura ulcer (principally among the natives), intestinal worms, ringworm, Delhi boil, and epilepsy. Diabetes and Bright's disease are also rather common among Europeans and natives alike.

In Northern India the European death-rate is greatest during the first and second years of residence; but in the south it increases with time, indicating the impossibility of acclimatization where there is no cold season to speak of. In the Bengal Presidency the death-rate is 23·60 per 1,000 for the first two years, 12·9 during the next three, and 17 after ten years spent in the country. In the Madras com-

mand the mortality for the first and second years is 13·4 per 1,000, from the third to the sixth year 10·45, while for those who have spent more than ten years in the country it is 43 per 1,000. Enteric fever is more frequent between the ages of twenty and twenty-five than among boys under twenty; while other fevers and heat apoplexy are most fatal during the two first years in the country. The heaviest mortality after ten years' service is due to hepatitis, heart disease, dysentery, and heat apoplexy.

Nepaul is an independent hill state on the north-east of India. The wet season is from June till October, and the cold from mid-October till April. The climate is good, with clear keen mornings and bright warm days. The lowest temperature is 25°, and there are slight rains from Christmas till February, with snow on the higher hills. The hot season, from April till June, has a temperature of 85°. The rainfall is 60 inches.

The swamps of the Terrai are unhealthy; but the hills where the capital, Katmandoo, is situated are healthy.

Cashmere is a high mountain valley, with a beautiful temperate climate, on the north-west side of India.

AFGHANISTAN.

This country is rugged and elevated, but healthy, some of the mountains, such as the Hindoo-Koosh, attaining an elevation of 18,000 feet. In the upper valleys the cold is extreme, and on the western plains the summer heat is oppressive. There is a great want of rain in the interior, and timber is scarce, but the valleys are fertile.

Respiratory and abdominal diseases prevail.

CEYLON.

The climate of Ceylon, which lies due south of India, is similar but more equable than South India, and, like it, receives the south-west monsoon, which, on the west coast, blows from May to September, and the north-east during the rest of the year. The latter is changed into a long-

shore wind in February and March. The mean annual temperature of Colombo (west coast) is 81°, mean of April (hottest month) 82°·7, January 78°·19. The rainfall is about 70 inches, being heaviest in May, October, and November. The humidity is very great. At Kandy, elevation 1,676 feet, in a hollow in the interior hills, the hot season is oppressive; but the cold season is pleasant enough, the mean of January being 62°, and of June 69°·8, and the relative humidity 63 per cent of saturation.

The table-land of Nowera Ellia, fifty-two miles from Kandy, has an elevation of 6,210 feet, and possesses a temperate climate, the annual mean being 59°. The lowest recorded is 27°, and a little frost may occur in the coldest months. In one day in the winter the heat may range from 27° at daybreak to 62° at eight a.m., 70° at mid-day, and 50° at dusk. The air at this season is dry, the relative humidity being about 38 per cent. of saturation, with a barometer of 24·25 inches. The climate is similar from day to day. From June to November, when the station is much needed, the climatic conditions are unfavourable. The air is almost saturated with moisture during the height of the monsoon, 30 and even 70 inches of rain being recorded.

Nowera Ellia is well adapted for those enfeebled by the heat of the plains, but is unsuited to sufferers from consumption, dysentery, or hepatitis. There are also other hill stations.

In addition to the Peranghi disease, a species of curable yaws confined to the natives, the diseases are similar to India. Hepatitis is rather common at Colombo. Galle is healthy; but Trincomalee, on the east side, with a splendid harbour, is said to be very malarious.

HINDOO-CHINA, INCLUDING BURMA, MALACCA, SIAM, ANNAM, COCHIN-CHINA, AND TONQUIN.

The Hindoo-Chinese peninsula, while subject, in common with India, to the influence of a tropical latitude, of a lofty

Himalayan northern boundary, and of the moisture-laden, warm, south-western winds, differs from that country in the following particulars : Instead of broad plains and extensive plateaux, protected from the watery winds by a sea-coast range of mountains, the whole country is cut up into a series of narrow river-valleys by long ranges of mountains, trending in a southern direction from, and at right-angles to, the Himalayas in the north. This immense region, extending from the Tropic of Cancer to within one degree of the equator, and including, beside Burma, the kingdoms of Siam, Annam, Gambodia, and Tonquin, may be said, at all events as regards its interior, to be one of the least known regions of Asia.

As regards the mountains, while the Yoma Aracan range, dividing the valley of the Irawady from the province of Aracan, and protecting it to some extent from the copious rains of the coast, is of low elevation, that between the Irrawady and the Salween rivers, and between the latter and the Meking, attains, though narrow, an elevation of from 3,000 to 7,000 feet. In the north are pressed together an extraordinary number of separate ridges, between which the rivers Irrawady, Salween, Menam and Mekong run south in close proximity to each other, and forming, as they approach the coast, low-lying alluvial deltas, producing rice in abundance.

All the great rivers inundate their banks in summer, and are the source, both during the floods and on the recession of the waters, of bowel, hepatic, and malarial disease; and it is owing to this cause and to the valley-like formation of the country, the heavy rains and extensive jungles, that the greater part of this region is far more relaxing and unhealthy than India.

The narrow Malayan peninsula, extending to within two degrees of the equator at Singapore, is flat, and is, perhaps, the most equable and healthy part of this region. The seasons in Hindoo-China are the same as in India, and the south-west monsoon commences on the west side in April, and lasts till October. Although the mountains influence the

amount of rain, they do not cause the alternations of season which the north-east monsoon sets up on the Coromandel coast, for the mountain range north of Tonquin prevents the north-east winds from approaching or deluging the plains of Annam on the east of the peninsula. These lofty mountains, however, together with the lower descending ranges, resist the south-west monsoon and help to deluge the entire region for nearly half the year.

Burma is divided into Upper and Lower, and is all under British influence. Lower Burma extends from the Naf river, in lat. 20° 5′, to the Pak-chan river, in lat. 10° 5′, the extent of sea-coast being 900 miles, and the area 90,000 square miles.

The climate is warm, damp, and relaxing. The interior, which in the hilly province of Aracan in the north consists of impenetrable forests, and in the more open and river-intersected provinces of Pegu and Tenasserim, of an immense extent of jungle and elephant-grass, is exceedingly feverish, remittents being common. The coast-towns, however, are not unhealthy, and, though damp and rather cool, have a not very disagreeable climate. The nights are generally agreeable, and punkahs are not needed.

Of the principal stations, Moulmein, in lat. 16° 30′, has a mean temperature of 79°, and a rainfall of 190 inches.

The hot season is from March to July, the rainy from July to November, and the dry for the rest of the year. Slight rains in April moderate the hot season. After the rains the weather is sultry for a month till the middle of November.

Tavoy is never very hot, the lowest temperature being 65° and the highest 95°, and the annual mean 80°. It rains 23 inches in May, 36 in June, 51 in July, 39 in August, 27 in September, and 24 in October.

At Mergui the heat varies between 93° in April and 68° in December and November at sunrise. There are swamps to the south and east, and the rainfall is 180 inches, some falling every month.

Penang is an island, and is much hotter than Mergui. The rainfall is 80 inches. There is no cold season, and the evenings and nights are cool, with heavy dews. The hills shut out the station from the sea-breezes. Climate very trying to Europeans.

Rangoon lies on the Rangoon River, and the cantonment is 100 feet higher than the town. There are no swamps very near, and the soil is permeable. The mean temperature is 80°, and the rainfall 80 inches. It is not so cool as Moulmein, but is well drained, and not malarious or unhealthy.

Thyaetmyo, near the old frontier, has much swampy grass-lands all round. The air is much drier than at Rangoon, and the cold season and alternations more marked. It is on the Irrawady, and subject to partial floodings.

Upper Burma occupies the Irrawady and Salween basins and the head waters of the Tsitoung, and extends away north to China and Thibet. It is also traversed by the Myt, the Kiwendwen, and other branches of the main rivers.

Climatically Upper Burma may be divided into three parts—Burma proper occupying the Irrawady valley, and the valleys of Kiwen and the Myt rivers from Thyaetmyo to Bhamo, near the Chinese frontier of Yunan. North Burma beyond this point is occupied by the wild Kakyciens, and this part, which is little known, is hemmed in on all sides by mountains, and is so extremely unhealthy that, in my time, a sentence of banishment to Mongoung, a town in this region, in lat. 25° 30′ north, was looked upon by the Burmese officials as equivalent to death. Besides the above, there is, in addition, the hilly country to the south-east, extending from the twentieth to twenty-fourth parallel north, occupied by the tributary Shan States. North Burma and the Shan States are unhealthy in the wet season. During the winter the air is keen, necessitating, even as one approaches Bhamo, the use of warm clothing, and rendering pleasant at night the grateful influence of the bivouac fire. The Shan country, situated as it is on the western slopes of

the mountains, cannot be otherwise, especially in summer, than feverish and unhealthy.

Burma proper is the most healthy, as it is the driest part of the country. In speaking of India, we pointed out the effects of the Western Ghats in obstructing rain-clouds, and thereby lessening so materially the amount of precipitation on their eastern declivities and the central plateau beyond. Here, in like manner, does the Aracan Yoma range of mountains, and also the Pegu range, to a considerable extent, lessen the rainfall, particularly in the western and central parts of the Irrawady basin. As the clouds, however, approach the range forming the eastern watershed of the Irrawady, the rainfall must necessarily be great, as owing to the superior height of this range, the state of affairs is somewhat analogous to that which presents itself in Assam, where 50 feet of rain has sometimes been registered.

In Upper Burma the cold season is fairly agreeable to Europeans, and becomes more so the higher we proceed up the river. The noonday sun is powerful still, but the mornings and evenings are cool, bracing, and pleasant. There are, however, great diurnal variations, and often a keen wind, especially on the rivers, towards evening. The hot and rainy seasons are, however, hotter, and the air more still, in Upper Burma than in the coast districts, owing to absence of land and sea-breezes, the formation of the valley, and the diminished amount of rainfall. In Mandalay I have myself often, even at night in the house, seen the glass stand at 108° Fah., and found it necessary to lie in the passage between two doors to get a little air.

The houses are all built on piles, and constructed of boards and bamboo-matting. Thus they afford perfect perflation of of air, and are well adapted to maintain the health of the natives, as they would, perhaps, also that of Europeans if situated beyond the reach of inundation, and had their foundations properly drained and concreted. The prevailing diseases among Europeans, contracted in the capital and other well-cleared towns on the river, are dysentery,

diarrhœa, and acute hepatitis. Fevers, so prevalent and virulent in the remote villages and amongst those engaged in the occupations of forestry or mining, rarely originate in the capital; at least, those which came under my notice occurred in the outlying parts of the country. As regards the prevailing diseases—dysentery, hepatic affections, fluxes, and fevers—although I have no statistics to offer, I may say, as the result of my own experience, from considerable practice amongst the Europeans of all nationalities, as well as the Chinese and river population of the Irrawady flotilla, that the Anglo-Saxons, or, to speak more correctly, the British and Germans, were more predisposed to hepatic diseases and fluxes than the French or Italians, and the Chinese and Eurasians less so than either. Fevers, on the contrary, seem to attack all with equal impartiality, the only predisposing qualification being that of newness to the feverish district. In my time, out of three medical men, one of whom only (myself) was in active practice, one succumbed to hepatic abscess, one to fever, and the third (the writer) was placed *hors de combat* from abscess of the liver following dysentery, and brought on from a chill caught in the discharge of the duties of his profession. As regards the river-faring population, aguish disease was essentially rare among the superior and well-fed European sailors, but of frequent occurrence among the common sailors, natives of India. Of six young missionaries, Frenchmen, who arrived brimful of health and went into remote stations, after three years' residence but one remained in the country; the rest either died or went home. The Chinese also suffered much from these affections; thus, by far the worst and most pernicious fevers I have ever seen, occurred among the Chinese Mohammedan rebels, brought on from exposure during their flight overland from the frontier of Yunan to Mandalay.

There are several available sites for hill sanitaria in the ruby-mine district near Mandalay, and in the hill country of the Karens and Shans.

The climate and diseases of Siam are similar to those of Lower Burma.

The climate of Cochin-China, and particularly Lower Cochin-China round Saigon, is the worst in Hindoo-China. It is damp, hot, steamy, and so exceedingly malarious that white children born in the country rarely survive. Dysentery is also a frequent disease, but hepatitis is said to be rare.

The climate of Anam is, however, fairly good for a damp, hot one ; and that of Tonquin, which is the most fertile and thickly-populated country in Hindoo-China, in the low rice plains, amid the delta of the rivers, resembles Calcutta, while that of the higher back country approaching the mountains is subject to great cold, keen winds, cool nights, hot days, and heavy rains in the wet season. It is an unhealthy country for Europeans, hepatitis, dysentery, and fevers being rife.

The climate of Hindoo-China is generally unsuited to European children and to consumptives, and the whole region is incapable of European colonization.

CHAPTER IX.

Persia—Asia Minor, with Health Resorts—China—Japan—Central Asia and Siberia—Salubrity and prevailing Diseases.

PERSIA.

Persia lies between 25° 50′ and 40° north lat. There are three climatic divisions; first, the arid burning and foggy sea-coasts already described under the head of Arabia; second, the central highlands, with a temperate climate, pasture and arable lands; and third, the north, with snow-clad mountains, a prolonged winter, great cold and moisture, and a hot summer.

On the central table-lands, though the winters are very cold, it is intensely hot in summer, yet, owing to the dryness and clearness of the air, the heat is never unbearable. Towards the south, on the plateau of Kunar-Takhtah, about sixty miles inland and 1,800 feet above the sea, the heat in summer may reach 100° Fah. Fifty miles further inland, at an altitude of 7,000 feet, the temperature is cool, and twenty-four miles still further, at Khani Lanian, the climate is remarkably pleasant.

Shiraz, 4,750 feet elevation, though subject to poetic laudation, is very hot and dry in summer.

At Ispahan the highest temperature in the house in July is 87°, and in the mornings 70°. The night air is dry, cool, and clear, and the dew insufficient to prevent sleeping on the house-tops. The late summer is hotter, but the autumn is prolonged and delightful. In May and June the mean temperature at Ispahan is 56°. In summer it is 87° at two p.m., and 67° at nine p.m.

At Teheran, the capital, there are 62° of heat at one p.m. in June, 75° at two p.m., rising to 80°. In February the cold on the plains near this town is very great. In September and October the weather is charming and invigorating, the sky being intensely blue, owing to the reflection of the snows of the neighbouring mountains. At the commencement of the hot weather, the people of fashion go out to the Yalaks of Shamiran near the hills, and return in the autumn.

The average rainfall is about 10 inches, and in the central and southern parts about 5 inches, and, were it not for the snows on the mountains, nearly the whole, instead of one-half the country, would be a barren desert. Persia is a healthy country, unless on the coasts. The Caspian shores are low-lying and feverish; while on the south coasts the worst tropical diseases prevail. The central uplands are well suited to the tuberculous and scrofulous, and are capable of European settlement.

ASIA MINOR.

The centre is a great terrace, surrounded by lofty snow-capped mountains and traversed by numerous ranges.

The climate on the central plateau is severe in winter, particularly towards the east. Along the Mediterranean sea-board terrace the climate is very hot; but towards the north the heat is less, and the Bosphorus is sometimes frozen. The soil is a deep, rich mould, producing corn and other crops in abundance. Many parts are capable of European colonization.

The diseases are similar to those of Arabia, the Aleppo button being especially frequent.

PALESTINE.

In the valley of Judea and the Dead Sea desert, which is from 1,000 to 1,300 feet below the level of the sea, the mean annual temperature is from 75° to 70°, while on the littoral plain it is from 70° to 68°. In the valley of the Dead Sea it is contemplated to set up a station where

naturally compressed air can be inspired. In Jerusalem the mean temperature is 62°, the lowest average is 42°, the greatest cold 22°, and the greatest heat 92° in the shade and 143° in the sun. There are few roads, but a good one from Jaffa to Jerusalem. The rainfall at Jerusalem varies from 44 to 85 inches, and is greater than the average of the district. In the southern lowlands the heat is most oppressive. The maritime plains are something like the climate of Italy. Except in the south the climate is salubrious.

Health Resorts in Asia Minor.

For those who find the climate of Egypt unsuitable in spring, as well as for others who wish for cheap and comfortable winter quarters, Beyrout and Haifa, in Syria, should be remembered.

Beyrout has good hotels, numerous carriages for hire, good roads, a picturesque back country, and a street of European shops.

Haifa is ten miles from Acre, with which it is connected by omnibus; and there are carriage roads to Nazareth and Cesarea. There is a German colony here, a good hotel, an extensive monastery, and a good food supply. Houses are also obtainable. From October till January the climate resembles a beautiful dry English summer; then it becomes a little chilly when the scanty rain falls. It does not get hot till May. In addition, there is good bathing, shooting, and pleasant excursions; steamers call about once a week. The winter climate is warm, dry, and invigorating.

CHINA.

China is traversed by two great mountain ranges running from west to east, viz., the Peling range in the north, and the Nan-Ling in the south. These ranges divide the country into four river-valleys, watered by four great rivers.

The climate varies according to latitude, elevation, and proximity to the sea. Some of the provinces are over

lat. 40° N., others under 20°; while some of the western are elevated plateaux, and the eastern are low-lying plains backed by the ocean.

In the same latitude it is colder in winter and hotter in summer than in Europe. At Pekin (lat. 40°) the winter is so long and severe that it freezes continually from November till March, when an excessively hot summer follows without any interval. The rainy season is from June to November.

The climate of Shanghai, which may be taken as the type of the more southern or sub-tropical coast towns, is one of great summer heat. It is in latitude 31° 14′ N., and in July, August, and September the heat rises above 100°, is generally about 96°, and is seldom lower than 90° in the forenoon, and 80° at night; yet, owing to the narrow streets and to the fact of their being covered with mats, sunstroke is almost unknown. This season is very trying to Europeans. From October till March the temperature varies from 32° in December to 76° in March. The spring and autumn are the most variable and unhealthy seasons.

Owing to great summer heat, the sudden changes, the malarious nature of the surrounding country, and the faulty water supply, Shanghai is not desirable as a prolonged residence for Europeans. According to Dr. Jameson, diphtheria, croup, laryngitis, measles, and scarlet fever are almost unknown. Strumous children do well. Children and women should spend the hot season at one of the hill-coast health stations which are to be found near some of the treaty ports. The weak and debilitated are not likely to pick up at Shanghai. The most frequent diseases are those of the vascular system and kidneys, especially among sailors; and dysentery, meningitis, and whooping-cough among children. In autumn remittents and intermittents, known as Shanghai fever, prevail. Phthisis is rare, and phthisical patients generally improve. Brain diseases are common, and hepatic abscess is by no means rare. Cholera sometimes appears in summer and autumn. The sprue, which is similar to the hill diarrhœa of Simla,

is sometimes observed, as well as leprosy, which is often latent in the female; elephantiasis, sunstroke, and the Madura ulcer, which in Asia Minor is known as the button of Aleppo.

Hong Kong, lat. 22° N., is an island twenty-seven miles in circumference, at the mouth of the Canton River. It is mostly barren and hilly, the highest peak being 2,000 feet above the sea. The soil is disintegrated granite, syenite and laterite clay. The mean annual temperature of Victoria, the capital, is 73°, the mean of July 86°, of January 52°·7. The north-east monsoon continues from November till April, when it is cool, dry, healthy, and bracing; the south-west blows from May to October, when it is hot, damp, and enervating. Hong Kong is not a very healthy place, and the unhealthiness is due to the nature of the soil, the rice-fields, and the great number of hills and ravines. Malarial fevers, typhoid fever, lienteric dysentery, and phthisis are the prevailing diseases.

Couboon, on the mainland, is not so healthy as Hong Kong; while the Portuguese station, Macao, forty-two miles up the river, and a second Monte Carlo, is said to be much more so.

Salubrity of China.—Taking it all round, the climate of China is salubrious, invigorating, and favourable to the longevity of its people. Well-to-do Europeans, merchants, and officials, and their families, dwelling in suitable houses, living on a variety of good and cheap food, avoiding excess in eating and drinking, and taking moderate and regular exercise, will, with ordinary precautions against sun and chill, enjoy good health. In the southern parts the rearing of European children is a matter of considerable anxiety. The foreign babies, as in India, being suckled by native women, often require additional food in the shape of cow's milk and water, and as cow's milk is difficult to get, Nestlé's or Mellin's food becomes invaluable. The custom of the nurse chewing the food, by changing the starch into grape-sugar, and then giving it to the child, is a good one. The

diseases of women are also much influenced by climatic causes; while as regards the younger men they are often due to carelessness and want of precaution. Old residents who are careful to guard against changes are by far the healthiest part of the European community. As compared with India, we may say that in the greater part of China acclimatization is possible, but in India it is not.

Geographically Thibet is one of the most remarkable countries in Asia, being the highest table-land on the globe. On the south and west it is shut in by the Himalayas, in the north another lofty chain of mountains divide it from Tartary and Mongolia, and yet another from China proper on the east. Some parts of the plateau attain a height of 16,000 feet, and the average elevation of the main road from L'Hasa to Gartokh is about 14,000 feet for a distance of eight hundred miles. The interior is also cut up by many mountain chains which cross each other in all directions. All the great rivers of China, India, and Hindoo-China have their sources either in Thibet or near it. There are also numerous lakes in the interior. The soil is generally rocky and barren; but the mountains of Bhotan are covered with forests, gardens, and fields; while in some fertile valleys wheat, peas, black barley, and delicious fruit are produced.

The climate, however, is very rigorous and extreme, and so cold are the winters that the natives are sometimes compelled to descend into lower valleys or to the south. At 28° N. lat. the cold is equal to what it is at lat. 45° in the Alps. The spring is variable and stormy, and snow still falls in June, to recommence, after a short summer, in September. The rain ceases in October, and during the rainy season the mornings are foggy, the evenings wet, and the nights saturated with cold vapour. This season is depressing.

The country is healthy to the strong but unsuited to the weak.

The climate of Turkestan is temperate, the snowy mountains moderating the heat of the southern districts.

Turkestan is a desert plain 200 feet above the sea. There is a short and warm summer, and the winter is long and extreme.

JAPAN.

The climate of Japan depends on the latitude and on the influence of the warm current from the southern seas. In the north island the winter cold is extreme, and the summer warm; but below the 36th parallel, in the south island, the climate is one perpetual summer. At Tokio and Yokohama the summer begins in May, and in July and August the heat rises to 104°. The south-west monsoon continues from April till September, with great humidity towards the end of the rains. There is also a short exaggerated rainy period at the end of winter. The rains towards the north, however, are very irregular; but storms are frequent in summer.

The best time for travelling in the interior is in May and October.

The temperature of Nangasaki, lat. 32°, is 28° Cent. in August, and 8° in January; of Yeddo, lat. 35° N., 23° in August, and 4°·5 in January, while that of Nacodadi, north island, is 20° in August, and 2°·5 in January.

At Yokohama the winter days are clear and warm, with slight frost at night. In this district the spring is wet, summer hot, and autumn windy. Japan is a healthy well-cultivated country, and the air is generally exhilarating, unless in the wet season. Malarious diseases, unless in the district of Nangasaki, are rare. Chest affections, rheumatism, consumption, scarlet fever, measles, beriberi, syphilis, and uterine ulcers are the most common diseases. Japan is not to be recommended to poitrinaires.

MANCHURIA, COREA AND KHIVA.

Manchuria is covered with ice for seven months, and the summers are short and hot. Khiva, is a land of steppes,

with icy gales and fogs and warm summers. Corea has a damp cold climate, and is covered with forests.

Bokhara, consists of extensive plains, which, unless near the rivers, are barren and deserted. The caravan routes are from Bokhara to Samarcand, and over the Terek Pass to Kashgar. The climate of Great Bucharia is rather temperate, the snowy mountains lessening the heat of the southern parts.

Bucharia is fertile, with rivers and mountains, but with few trees.

SIBERIA.

The extreme cold and long winters of Siberia are not due so much to latitude, which is the same as the British Islands and Norway, as to the effect of the north wind blowing from the snowy mountains and polar regions across wide unsheltered plains, and to the extreme continental position and plateau formation of the land. The snowy winters last nine months, and there is scarcely any spring, the summer being suddenly ushered in with rapid vegetation. In the north the sun does not set for months, but in the south the longest day is 15 hours. Warm winter currents are, strange to say, most felt in the more elevated parts, from which they blow down on the lowlands extremely cold. The summer is warm, short, and dry, with an unclouded sky.

Merv, lat. 37° N., has a pleasant winter climate, but the summers are very hot, dusty, and oppressive to the organs of respiration.

CHAPTER X.

Africa—Its different Countries and their Health Resorts.

Africa is *par excellence* the tropical continent, as the whole region, with the exception of the Barbary and Egyptian States in the north, and the country below the Orange and Limpopo rivers in the south, is in the torrid zone. Africa lies between the 37° 26′ N. lat. and 34° 15′ S. lat.

There are seven great divisions, viz., Northern Africa, North-Eastern Africa, Central Africa, Equatorial Central Africa, Eastern Africa, West Coast of Africa, and Southern Africa, with the islands of Madagascar, Zanzibar, Mauritius, Bourbon, Sokotra and Seychelles, with others in the Atlantic.

The continent is physically divisible into the lowland districts, which extend from 50 to 300 miles from the coast, and the interior plateaux, whose average elevation varies from 2,000 feet towards the west to 3,000, 4,000, or even 5,000 feet towards the high mountains on the eastern side in the vicinity of the great Livingstone system of lakes. The Sahara and Nubian plateaux are, however, of much lower elevation, while that of Algeria is independent and confined to the northern slopes of the Atlas mountains. Mountain ranges skirt the borders of the great central plateau, and are highest on the eastern side, rising in Mounts Kilima Njaro and Koenia to something like 20,000 feet.

For some degrees on either side of the equator this continent is mostly covered with forests. Outside the forest tract the country becomes more open and park-like, gradually merging towards north and south into open plains and grassy meadows, which in turn lose themselves in the great

Sahara and Kalahari deserts. To the north and south of these deserts are respectively the Atlas mountains and the States of Barbary, and the temperate upland regions of Cape Colony.

NORTH AFRICA.

This region includes Algeria, Morocco, Tunis, Tripoli, and Barca.

Algeria.

The climate of Algeria, Morocco, and Tunis, is essentially influenced by the Atlas mountain range, which extends from Cape Gers on the Atlantic to Cape Bon in Tunis, and which in Algeria is scattered into three massive parallel ridges, known as the Great, Middle and Little Atlas.

Algeria is divided into the sea-coast district, the Tell, and the desert beyond. The Tell rises gradually from the shore to the summits of the mountains, at an elevation of from 3,000 to 8,000 feet, and is a region of hills, mountain-peaks, terraced plateaux, and upland plains.

The climate of the sea-coast, which is cut up by mountain-torrents, subject to inundation in the wet season, is mild, uniform, and equable.

The mean annual temperature in the province of Oran is 60°·8, the mean of the province of Algeria 69°, and the mean of Bone 70°. In the City of Algiers the mean of January is 59°, and of August 81°; and the thermometer has only descended below zero or risen above 90°·4 once in seven years. The yearly mean of diurnal change is 42°, and of nightly change 36°.

In the Tell, particularly towards the desert, the days are very hot and the nights extremely cold, and the air, especially towards the coast, is bright, buoyant, and transparent. The number of wet days in the town of Algiers is 95, and of cloudless days 200. The relative humidity is about 40 or 50 per cent., the extremes being between 16 and 80. The rainfall is 904 m.m. In Oran the fall is 489 m.m.

The rainfall is less in the interior, with 56 wet days. On the coast the rainy season begins in October and ends in March or April; and the dews, which are extremely heavy in the interior, are almost unknown. Snow lies on the high peaks from November till March, but is a *rara avis* on the coast. The land and sea breezes blow in the dry season; and a mild, but still a parching, sirocco varies from a few hours to two or three days in the year.

March, April, May and June are the most pleasant and healthy months; July and August occupy the hot season. From late October to December the rains begin; October is a pleasant month; January and February are the months of the heavy rains, inundations, and great variations.

In the province of Algiers ague is the most common complaint, but at Oran, where fevers are infrequent, dysentery and hepatic abscess, so rare in Algiers, are common. The infant mortality is a quarter higher than in France, and the military mortality is 1·20 per cent. Chest affections are rare on the coast, but pleuro-pneumonia is prevalent in the interior in winter. Phthisis is rare, as well among the military as the civilians; but here—as in all hot countries, whether the climate be moist or dry—the developed disease, from one cause or another, runs a rapid course. Consumptives should not go to Algeria after the disease has passed the second stage. Australian physicians sound a similar note of precaution, and in the beautiful dry climate of South California the majority either die or begin to improve after a sojourn of a few months.

The principal health resorts are the town of Algiers and Hammam R'Irha, and Blida is a good starting point for excursions.

Invalids intending to winter at Algiers should secure a sunny villa or lodgings in the suburb of Mustapha,* or put up at the English boarding-houses—the Villa Roussell, the Villa des Palmiers, the Hotel Kirsch, or The Grand

* Many people think the heights of Mustapha not only out of the way, but difficult of access.

—all in the same quarter, as the French part is close to the shore, at the foot of the hill on which is built the crowded Arab town. The drainage of the hotels in this quarter is said not to be the best, and the accommodation and comforts very inferior to the hotels on the Riviera. Should one have no option in the matter, apartments removed from the basement and facing the sea should be selected; or if a patient prefer it, or should the stage of his malady admit it, he might move on by rail fifty miles to Hammam R'Irha,* a health-resort 2,000 feet above the sea-level, and possessing a site which for extent and scenic beauty is not excelled in Europe. The hotel here is comfortable and the weather delightful, with a good deal of sunshine, and a temperature of 60° Fah. in the month of March. The hot-water springs, which rise to 114° Fah., are mildly saline, and are used for bathing purposes; while there is in addition a cold alkaline and ferruginous spring, which is the ordinary drinking water. This is, no doubt, a charming retreat, and affords an agreeable change from Algiers in the spring; but the winters are rather too chilly and variable for delicate invalids. The air is mild, pure, and tonic, and suitable to convalescents from acute disease, and to sufferers from excessive mental and bodily fatigue; and the baths are useful in rheumatic, scrofulous, and other diseases. Consumptives who go to Algiers would do best to stay over two winters, with the intervening summer, which is generally pleasant and cool.

Morocco.

Morocco is a dry, healthy country, but the climate is more extreme and the diurnal changes greater than in Algeria. The coast towns, from Tangier to Mogador, are healthy, and the climate, both of the coast and interior, pure, bright, warm and enjoyable.

Tangier, though mild in winter, is wonderfully cool and

* Hammam R'Irha is three hours by rail to the station at Bon Medfa, and then two hours by coach up the hill. The journey is very pleasant but fatiguing.

pleasant in summer, when it is frequented by visitors wishing to avoid the heat at Gibraltar. Besides the hotels, there is a very agreeable pension (Onnetto House), where the terms are from £2 16s. to £3 10s. per week. Invalids with delicate lungs stay on throughout the whole year with much benefit to themselves. English medical practitioners are always in residence. The early autumn is remarkably healthy and agreeable, and the winter is favourable for all nervous disorders. The leading feature of the climate is its moist equable character. The variations of temperature are peculiarly small between day and night, and also between summer and winter. The summer, which extends from June to September, is very dry, and, as a rule, without rain. The winter season (October to May) is mild, with a moderate rainfall.* The temperature during the summer months varies according to the time of year from 65° to 80°, and in the winter from 50° to 65°. Anything outside these figures is very exceptional. Winter visitors should provide themselves with wraps and warm clothes. Thick boots are essential at all times on account of the rough stone paving which is used in Tangier. In Morocco there are no carriage roads, and therefore no wheeled vehicles. Donkeys can be obtained at very cheap rates. Horses and mules for riding are also easily procured. The sea-bathing is much sought after in the summer. The game (boar, etc.) is much appreciated by sportsmen. Tangier is a dirty foul-smelling place, and the east winds are sometimes trying to delicate invalids. Inflammatory chest and throat affections do well.

Mogador,

In lat. 32° N., on the west coast of Morocco, possesses a climate wonderfully well adapted for chest affections, the air being very equable, bright, warm, pure, and tonic. It is, however, a dull place, with a large mercantile Jewish population, a few English merchants, and a French physician.

* The rainfall is between 30 and 40 inches, and heaviest in October and November.

It is a very cheap place, but there is no suitable accommodation for invalids. It is, however, thoroughly healthy and clean. The mean winter temperature is 61° Fah.

Tunis.

The Regency of Tunis is hotter and drier than Algeria and Morocco; thus the city of Tunis, which is a large place, with hotels and a climate suited to chest disorders, has a temperature 2° Cent. higher than Algiers, in the same latitude. This is owing to the absence of a protecting range of mountains in Tunis. The southern towns are hotter still.

Tripoli and Barca.

These regions, unless along the coast, and in a few oases, are barren deserts. The mean annual temperature of the town of Tripoli is 70°, of January 56°, and of August 80°. The highest summer is 86° and the lowest 57. The air is dry and pure, and well suited to consumptives. There is *no* accommodation.

NORTH-EASTERN AFRICA.

This division includes Egypt and Abyssinia.

Egypt

May be divided climatically into (*a*) the Delta, (*b*) the valley of the Nile, (*c*) the eastern desert, (*d*) the western desert and oases. The political divisions are Upper, Middle, and Lower Egypt. One-tenth of the country is capable of cultivation, and the rest is composed of salt marshes, sandy plains, and rocky mountains. There are no woods, except a few scattered palms and sycamores. In the winter the Nile Valley is a beautiful garden, while in the summer it is covered with water. Nubia, Sudan, Kordofan, and Senaar are low-terrace lands.

The north winds, which in Egypt generally prevail, carry the evaporation of the Mediterranean basin towards the

highlands of Central Africa, where it falls in rain, leaving Egypt among the rainless regions of the globe. At Cairo there are but four or five, and in Upper Egypt but one or two showers in the year. During the Southern Khamseen the atmosphere is excessively depressing, a dry, scorching heat is universal, and the whirlwinds resemble the blasts from a furnace. From January till April the heat in Nubia is insupportable. The tropical rains commence in Nubia and Abyssinia in March, but are not felt in Egypt till the end of June. The river rises slowly for three months, floods the valley, and in autumn the waters begin to fall.

The rainfall, which is absent in winter and scanty in summer, is much greater on the coasts than at Cairo, and greater at Cairo than at Ballas;* dews are abundant, but fogs are very rare. The mean annual temperature at Cairo is 71°; the mean of January 55°, and of July 85°. The extremes and the difference between the day and night are great. At Cairo it may rise to 110°, at Esnah to 108°, and at Thebes to 120°, and fall in winter at Cairo to below the freezing point.

Salubrity.—The salubrity increases as we leave the Delta, and at Cairo, which is a crowded, dirty, low-lying city, the death-rate is about 30 per cent. Larrey considered Egypt a healthy campaigning country, but it has been very fatal to the British army of conquest and occupation.

The prevailing diseases are ophthalmia, dysentery, malarial and typhoid fevers, congestion and suppuration of the liver, and spleen. Small-pox, scrofula, syphilis, leprosy, round and guinea worms, and a specific affection of the urinary passages, described by Bilharz, are due to a trematode—the distoma hæmatobia. The Angyolostomum duodenale also occurs. Cholera and bubonic plague occur periodically. Chest affections, including phthisis pulmonalis, are rare, except among the blacks from the upper country, the inhabitants of large towns, and the entire people of the

* On the site of Luxor and Thebes.

Delta. According to Schnapps, consumption causes 14 per cent. of the general mortality at Cairo.

The winter climate then is warm, very dry, and invigorating, with considerable cold about sundown, and occasional keen north winds, which are apt to be dangerous at night, particularly on exposure during a voyage up the river. Other drawbacks are the dust and glare and the ugly nature of the country.

A winter's sojourn is especially useful in scrofula and early phthisis. Advanced cases if not of the irritable or hæmoptic type often do well at Cairo, Luxor, or *Heluan des Bains*. Heluan is on the edge of the desert, an hour's ride by rail from Cairo. It possesses a good hotel, and a pure, dry air.

Bronchial and laryngeal catarrh, asthma, nervous affections, and rheumatism are generally relieved or cured.

During the trip on a Nile boat—which is of the greatest value in incipient phthisis—the invalid should go below at sundown. All invalids should leave Egypt in spring, and go on to Syria or Algiers; as from March to May is the morbid season, associated with the drying of the soil, hot winds, and the scorching Khamseen. Consumptives should not stay at Alexandria, which is damp.

Abyssinia.

The climate of the highlands, which occupy the greatest part of the country, is generally cool and equable. These highlands are of good elevation, and are generally covered with pasture and cultivated plains. Forests are rare. The high plain of Santhana has a barren, rocky appearance, and is exposed to intense heat, with great daily alternations. Here fevers are prevalent and severe. In Abyssinia the rains commence in June and last three months. The coast-towns are subject to intense heat; but, except Massowah, which is close to the hills, they are, like the Egyptian Red Sea-coast generally, not very malarious. The swampy lands, both in the highlands and lowlands, are very feverish; but, generally speaking, the upper highlands, above 4,000 feet, are healthy, and suited to European colonization.

EASTERN AFRICA.

This division includes all the coast lands, from Babelmandeb in the north to Delagoa Bay in the south. North of the equator, to the 12th degree, are Adal Harar and Somali, with numerous towns. Between the equator and the tropic of Capricorn are Zanzibar, the English and German East African Companies' settlements, and the Portuguese coasts of Mozambique, and the countries Solfala, Sena, Tete, Cazembe, and Quilimane, which is an unhealthy place. The interior, at no great distance from the coast towards the Great Lakes, in many places consists of elevated plains and valleys.

In the southern hemisphere the dry season is from April to October, and the wet from October to March. The temperature on board the *La Cordelière* frigate off the island of Zanzibar was as follows: Mean of April 80°, mean of November 83°, at midnight 77°, at noon 85°·5. The highest was 87°, and the lowest 75° (Rochard).

South of Somali land, which is the healthiest part of the coast, is the British East African territory, with the ports of Mombasa and Melinda, the island of Lama, and the interior through 6° of longitude to Lake Victoria Nyanza, and from the lofty slopes of Kilima-Njaro on the south to the summit of Koeni on the north. Besides the peaks mentioned, there are others rising to 13,000 and 15,000 feet above the sea, with many plateaux from 4,000 to 8,000 feet.

Some of these lands, says Mr. Johnstone, possess a climate superior in salubrity to many parts of the Continent of Europe. East of Kilima-Njaro the greatest heat was 81°, and in the warmest part of the interior 91°. The average night temperature in the hilly districts is 60°, in the plains 68°. Except on the loftiest mountains and round the Victoria Nyanza Lake, where it rains a few days every month, the seasons in East Equatorial Africa are wet and dry. From June till October there is but little rain, but from November till May there is an abundant rainfall during certain months. On the lofty mountains the climate, at an altitude of from

4,000 to 5,000 feet, is like a Devonshire summer. Above you may have it as cold as you like as you ascend (Johnstone).

Mombasa, the principal port, is said to be an unhealthy, crowded place.

Freetown, close by, is a far more salubrious place, while the health resorts of Rabai and Kissolu-terri, with an elevation respectively of 1,000 and 2,000 feet, are prettily situated behind Mombasa, and afford an agreeable change.

Salubrity and Diseases.—The coast-lands and the swampy grounds, especially at the foot of the mountains in the interior and round the great lakes, are very malarious, while the hill countries of Usumbara and of the British Company are fairly salubrious. Fevers, however, occur all over this region, as well in the island of Zanzibar as in the hill countries of the interior. Dysentery, diarrhœa, and phagedenic ulcers, are also prevalent, and dengue has often appeared at Zanzibar.

Malarial diseases also extend far inland, along the Zambesi, the Rovuma, the Shiré, and other rivers. The region is neither suited to European colonization nor to consumptives.

WEST COAST OF AFRICA.

The West Coast of Africa is the hottest and wettest region in the globe, the tropical countries on the American shores of the Atlantic being highly salubrious in comparison. Near the Rio Valta the shade temperature rises to 100°, and the sun to 134°. In Senegambia it varies from 113° to 131°, with a dead calm.

The mean of Gaboon is 82°. The annual and monthly variations are slight, while that between the day and night are excessive, particularly in the northern parts, being as much as 71° Fah. at St. Louis, lat. 17°. On the Gold Coast the wet season lasts from April till November, August and October, however, being fairly dry. During the dry days in the wet season the exhalations hang in the air as a fog, and, as the winds are slight or absent, the weather is exces-

sively hot, unhealthy, and oppressive. From early December till April the sky is often serene, and the weather settled and not disagreeable. Storms, however, often occur. The dusty harmattan continues for about fourteen days in February, during which time the temperature is about 80° in the shade. It acts as a restorative to old residents, dispersing fevers and ulcers, while among new arrivals it causes fulness of the head, with great heat, dryness, and a febrile condition of the body.

In December, which is the *hottest month*, the weather is clear, and the land and sea-breezes very regular. In the wet season, owing to moisture and cloud-shading, the sensation of extreme heat, unless during the calms, is rarely felt, and it is possible to walk out without umbrella or solar sombrero. Often a feeling of chilliness is felt, necessitating fires and warm clothing, for, except during the harmattan, the moisture is everywhere extreme. Horses do not live on the coast, and no big game can be found for some distance inland. Snakes are common, amongst which the python and black cobra may attack unmolested.

At Gaboon the wet days are 160; 75 for the last half of the year, 25 in April, 16 in June, and 15 in May. In Ashantee, a little inland, the rainy season is from November till May.

This region, at least from Cape Verde to Cape Lopez, is undoubtedly the most unhealthy on the globe. It has been known as the white man's grave, and it well deserves the title. This unhealthiness is due to its excessive moisture and continuous heat, to the great daily and sudden changes, to calms, and to the winter, owing to the cooling influence of the summer rains, being the hottest time of the year.

To these conditions, and to the number of swamps, inundations, excessive vegetation, and decaying exhalations, West Africa owes its bad reputation. The annual mortality of the British troops from 1819 to 1836 was 48 per cent. at Sierra Leone, and 66 per cent. at Cape Coast Castle. In Senegal, among the French, it was only 10 per cent.; but

when yellow fever prevails, which it does periodically, it runs up to 57 per cent. Goree and the Portuguese coasts south of the equator are comparatively healthy; and Angra Pequena and Damaraland, being dry and barren, are generally healthy. The Cameroon Mountain is sufficiently high to form a valuable health-resort.

All tropical diseases are prevalent, including yellow fever, which occurs periodically, and craw-craw, a form of scabies confined to natives. Fevers and dysentery are most fatal, but hepatic abscess, unless in Senegal, is much less prevalent than in India.

In the kingdom of Dahomey north of the Slave coast the harmattan blows off and on from December till February. It is dry and parching, but lowers the temperature about 10°.

CENTRAL AFRICA, INCLUDING THE SOUDAN AND THE SAHARA.

The Soudan, also called Nigritia, includes all those countries south of the great desert on the Niger, the Senegal, Lake Tchad, and with the Egyptian Soudan extends eastward to the Nile. All this region, except the low swampy countries round lakes Tchad, Dibbe, and Filter, forms a plateau of low elevation, and possesses a dry and fairly healthy climate.

The Sahara lies north of the Soudan, and contains many oases and fertile valleys, and, like the Soudan, numerous torrents, which flood the country in the wet season. The country round Lake Tchad is highly malarious, but fertile and damp.

The climate of the Sahara is the hottest and driest on the globe. The Soudan is also extremely hot, and the difference between the day and night temperature is immense, being as much as 107° in tents near Lake Tchad, while that between the hottest and coldest months is only 40°. The mean annual temperature near Lake Tchad is but 80°, while at Khartoum it is 91°. The highest temperature at Khar-

toum is 116° in April and October, and the rainy season is from May till October. At the Gondokoro rapids on the Nile, in lat. 5°, where the Soudan rises into the higher equatorial plateau, the mean annual temperature, owing to rains and cloud shading, is 80°. Sudden falls of temperature are frequent in the Soudan, which is generally a healthy region, devoted to pasture and the growth of cereals.

EQUATORIAL CENTRAL AFRICA AND THE CONGO.

A line drawn from the Gondokoro rapids on the Nile across the continent towards the Kong mountains would mark the rise which separates the lower plateau of the Soudan from the more elevated one of Equatorial Central Africa. Coastwise east and west we have first the low-lying, miry, marshy, scorching, and sandy littoral, extending 200 or 300 miles, and generally more unhealthy in the west than the east of the continent. This terminates at the first mountain barrier marking the rapids and cataracts of the rivers, and succeeded towards the interior for 300 or 400 miles by a region of hills, plains or valleys, whose average elevation is from 1,000 to 3,000 feet. Eastward, towards the Livingstone lacustrine system, is a still higher plateau rising to 4,000, 5,000, or 6,000 feet. The general slope of the plateau is towards the west coast from the eastern mountain range. In these regions the nearer the equator the cooler and more equable the climate, owing to rains, moisture, and cloud-shading. The climate of the equatorial zone is superior to that of its borders (Drummond). It is cold at night, and the shade temperature rarely exceeds 95°. The country round Lake Ngami has an elevation of 2,813 feet, and is very unhealthy from September till May. The central regions between the upper courses of the Congo and the Victoria Falls on the Zambesi are fairly healthy, and towards the lakes at an elevation of 5,000 feet, are thus described by Bishop Hannington: 'The valleys and grassy downs are like Devonshire.' Above 6,000 feet the tangled forest begins, with dense undergrowth to 9,000 feet. Out-

side the equatorial zone, 'the genial atmosphere,' says Livingstone, 'never has that debilitating effect so common in India, and you may sleep out of doors with perfect safety.'

The Congo.

The highest mean temperature, according to Mr. Stanley, at Vivi is 90°, and the lowest mean 61°, the mean in the sun is from 100° to 115°. The highest in the shade is 97° in November, and the lowest 54° in July. Though the sun heat is low, it is dangerous when marching or when the body is fatigued, owing to perspiration and subsequent chilling, hence it is better to march between 6 a.m. and 11 a.m. (Stanley).

At Vivi it was overcast on 44 days, nearly so on 115, gloomy on 135, nearly serene 58, and quite serene on only 10 days. The winds often blow strong and cold from the coast, the nights are generally cool and sometimes cold; and the diurnal and sudden changes, though less marked than in the Soudan, have to be carefully guarded against The most prevalent diseases are fevers and dysentery, tetanus and sunstroke. The fevers are of three kinds, ague, remittent, and bilious pernicious. Ague lasts three days, is of a mild type and never fatal; remittent is the result of exposure to sun-chill and miasma, but is rarely fatal; the pernicious or exaggerated remittent is most probably due to intemperate habits, to chills, and great exposure to the sun when fatigued; it is generally attended with convulsions. Stations are found to differ much in salubrity according to site. 'At Boma,' says Mr. Stanley, 'on the edge of the river, in the midst of marshy exhalations, Europeans enjoyed better health than at Vivi, built on a rock, in a dry region, and 340 feet above the river.' Also at Kinshassa, 10 feet above the river, Europeans enjoyed immunity from disease, while at Leopoldville, 95 feet above the river, sickness prevailed, and Equator station, 5 feet above the river, on a miry creek and alluvial soil, was more healthy than

Majunga, 240 feet above the river and 1,100 feet above the sea, on a hill almost entirely surrounded by deep ravines. The greater healthiness of the lower stations must, I think, be attributed to their greater equability, and to the avoidance of frequent changes from the elevated windy station to its wharf on the river; it also bears out what I have said in another chapter, with reference to the danger of ravines and isolated hilltops in the selection of sites. The Congo, *with care*, may be said to be fairly salubrious for a year or two. It is, however, no country for Europeans, unless engaged as officials or overseers, or other work requiring no very hard manual labour either in the sun or the shade. The great difficulty is the acclimatization of Europeans, a difficulty which exists throughout the greater part of the African continent. The glaring accounts of well-seasoned travellers, fascinated with their favoured tropical countries, should generally be received with some reservation. In this very region the services of many intelligent and devoted men have been lost because they were too suddenly brought into a climate differing in *toto cœlo* from that to which they had been accustomed. Many unsuitable people also go out. 'Up to the present,' says Mr. Stanley, 'the losses have been heavier on the west than the eastern coast, but heaviest of all in the Congo.' Yet the Congo, at least the upper part, is more salubrious for a prolonged residence, though being less equable it is more dangerous to those unacquainted with tropical climates; for this reason, officials, managers, and overseers should be chosen from old soldiers who have been accustomed to hot countries. The Congo is unsuitable to poitrinaires or to other invalids, and also to women and children. Here, as in all other hot countries, no alcoholic drink should be taken till sunset.

SOUTHERN AFRICA.

Southern Africa comprises the country south of the Limpopo river on the east and the tropic of Capricorn on the

west, to which may be added the interior highland districts of Bechuanaland and other countries to the Zambesi.

South Africa is mainly made up of a succession of terraces descending gradually from the interior highlands, and separated from each other by parallel ranges of mountains. One of these, called the Great Karoo, is from 50 to 80 miles broad. The shore terrace is fertile and fairly well-watered, the middle terrace has an elevation of from 1,000 feet to 2,500 feet, and the upper terrace from 2,500 feet to 5,000 feet. These terraces are connected by steep passes called khloofs; during the rains they are clothed with verdure, but during the dry season they resemble a desert of dust.

The coast lands extend for about fifty miles to the shore terrace. In Natal the shore terrace is wetter than in Cape Colony, and the vegetation is tropical; the second is devoted to pastures and forests, and the rearing of cattle; the third to wheat and grapes; and the fourth, supported by the Drakenberg mountains, has a most delightful, invigorating and healthy climate. The Orange Free State is mountainous towards the east, descending towards the west by terraced prairie lands. The trans-Orange country of Great Namaqualand is a dry desert region, between which and Bechuanaland is the Kahalari desert. The soil of Kaffraria is fertile and well-watered from springs, though rain is scarce. Cape Colony is also in parts very productive, but generally the soil is a sandy clay, from which the water easily flows off.

The Orange Free State is dry and cold in winter, its average elevation being 4,500 feet. It has a desolate appearance. The rainfall is about 16 inches, and the wet days 70. Bloemfontein is the chief town, and, though the sanitation is not good, and dysentery and diphtheria prevail, it has a good climate for consumptives.

Ladybrand has an elevation of 5,000 feet, 27 inches of rain, 87 wet days, good sanitation, and a similar climate to Bloemfontein.

The Transvaal is a shallow basin, whose mean elevation is 3,000 feet, and is separated from the coast by two higher

mountain ridges. Owing to its dryness, elevation, and freedom from swamps, it possesses a salubrious and tonic climate, well suited to Europeans; and the western districts, being driest, are especially adapted for consumption.

The Limpopo river region is low-lying and malarious, and should be avoided. The Tsetse fly is common. The east side is well watered; but the west, bordering on Bechuanaland, owing to its approach to the desert, is arid and dry. The rains occur from October till April, and the precipitation is 60 inches on the east side, 30 inches in the centre, and 12 inches in the west. From April till September cool winds blow from the south. The mean annual temperature is 68°, of June 40°, and of January 90° to 95°. Good land can be rented at £15 for one hundred acres.

Johannisberg has an elevation of 5,000 feet, and is two hundred and eighty-five miles by coach from Kimberley. It is likely to become a very prosperous place, owing to its mines. The summer climate during the rains is moist. The winter nights are very cold. It is a very dusty, glary town, and quarters are difficult to obtain, and exceedingly dear.

Pretoria is also in the Transvaal, at an elevation of 4,000 feet. It is well sheltered, and hotter than Johannisberg, but not hotter than summer days in England.

The climate of Natal varies much. The rainfall is 33 inches, there being none in June and July. At Durban, on the coast, which is a healthy town, the highest summer heat is 97°, the lowest 53°, and the mean 71°. The highest winter is 83°, the lowest 31°, and the mean 56°. The upper districts are exposed to hot enervating winds from July to September.

The climate of Maritzburg is good for throat and chest irritation. Sudden change from hot, dry, land winds to moist sea breezes are frequent, trying, and often relaxing.

Bechuanaland, and all the central highlands to the Zambesi above 4,000 feet, have a good dry climate, well suited to the phthisical, and much of it is capable of colonization.

The climate of South Africa is generally very good, owing to the warmth, the dryness, the rapid movement of the air, and the freedom, even on the coast-lands, except between St. Lucia and Delagoa Bay, from severe forms of malarial fever. It is becoming rapidly opened up, and it is well adapted for that class of consumptives for whom, while not too particular as to luxuries, a prolonged residence is required, or who, having a tendency to consumption, should live out of England. When good accommodation and railways are provided, many fastidious invalids, who have not benefited in Europe, may also come to South Africa with a hope of relief.

The following are some of the stations best suited to invalids:

The Knyssia district, east from Cape Town, lies close to the coast, and is a lovely country, but too damp for consumptives. It is suited to irritative chest and throat complaints.

Port Elizabeth, though too oppressive from October to March, is from April till August a good station for poitrinaires. The rainfall is 19 inches.

The climate of East London is similar to Port Elizabeth.

Grahamstown is one of the most pleasant stations in the colony, with good social and educational advantages. It is one hundred miles by rail from Port Elizabeth, and is well protected from strong winds, has 22 inches of rain, and an elevation of 1,800 feet. The mean annual temperature is 60°, that of summer 65°, and winter 53°. It is a most convenient halting-place for invalids journeying towards the interior.

Port Alford is a seaside summer place, but not suited to consumptives.

Graaff-Reinet, elevation 2,460 feet, is very hot in summer, but is a good place for consumptives in winter.

Queenstown has an elevation of 3,540 feet, a rainfall of 16 inches, 76 rainy days, a mean temperature from November to February of 69°, and from May to August of 52°. The

sky is generally clear, with calm nights and no dews. This is a very good station for consumptives, as is also Aliwal North, with an elevation of 4,348 feet, and a rainfall of 18 inches. This station is twenty-four hours by rail from East London. The air is dry, cool, and bracing, and the winters have fine sunny days, crisp mornings, and sharp frosty nights. The rains occur in spring, and the summers are clear and serene. There is also good accommodation. This is one of the best places in South Africa for phthisical patients.

Tarkestad has an elevation of 4,280 feet, a rainfall of 8·85 inches, and a fine open situation, in a district where there are many English. It is reached from Port Elizabeth, and is much resorted to by invalids throughout the year.

Dordrecht has an elevation of 5,200 feet, 18 inches of rain, and is well frequented in summer.

Burghersdorp is in the East Karoo country, at an elevation of 4,650 feet, and has a rainfall of 11 inches. The summers are somewhat oppressive, but the rest of the year is temperate and pleasant. There is little verdure, and no mists or fogs.

The Stormberg Mountains are more equable, with warm nights and pleasant days.

Craddock has an elevation of 2,850 feet, and a rainfall of 9·18 inches, and a humidity of 62 per cent. The climate is good for asthma and consumption all the year round.

Beaufort West has a climate like Craddock.

Hanover has an elevation of 4,600 feet, and a dry and bracing climate, well suited to phthisis, and to bronchitis in the young and middle-aged.

Fraserburg has an elevation of 4,500 feet, and a rainfall of 2·98 inches. The summer heat rises to 100°, and the winters are cold, with changes and strong dusty winds.

CAPE TOWN.

The climate of the coast-lands and the suburbs of Cape Town is warm and moist. The mean is 67°, the annual

range 38°, the rainfall 23 inches, and the wet days 70. At Wynberg and Rondebosh the air is bright in summer, but very damp in winter. The climate is enervating, and unsuited to invalids.

Kimberley has a mean summer temperature of 70°, and a winter mean of 50°. The summer mid-day temperature rises to 104°, yet men work all day with impunity in the sun.

Calvinia has an elevation of 3,100 feet, and a rainfall of 4·28 inches.

Pella in the north-west has only three wet days; and Middleburg has a good hotel and a favourable climate.

To sum up we may say that the summer heat by day is very great, and the soil sandy and scorching. Its bad effect is, however, counteracted by the fresh cool nights in summer and frosty ones in winter. In the daytime, too, the heat of the sun in those shadeless regions can be borne with impunity owing to the purity, dryness, and movement of the air.

Delicate invalids will, however, find the rough life and want of variety intolerable, and it must also be borne in mind that most of the day must be passed on the verandah, the houses being shut up, and therefore not well adapted to the treatment of chest affections. Locomotion is also in a backward condition. Invalids should not arrive in June, July, or August, when wet and cold weather is apt to prevail, nor should they make their first acquaintance with the interior during the midsummer heats.

Cases of incipient consumption may expect speedy improvement.

At first, unless where lung collapse exists, the Lower Karoo is best to be succeeded by a permanent residence at a greater elevation.

The principal local diseases are rheumatism, heart disease, climatorial fevers, ophthalmia, and mild dysentery. The climate is unsuited to cardiac complaints. Children are easily reared, but with more trouble than at home.

The land is rich in mines, but not generally very fertile.

Climatically, it is suited for European colonization, and there is a considerable native population, who do the hard work in the sun. Artizans and miners will generally do well.

The Upper Zambesi district is a vast, well-wooded plateau, from 3,000 to 4,000 feet above the sea.

The Barotse valley is 189 miles long, with a mean elevation of 3,300 feet. It is a thickly-populated, grassy district, and is flooded during the wet season. Near the Victoria Falls tsetse fly abounds. The Upper Zambesi is unhealthy during the wet season, but is less feverish than the Lower. It is unsuited for English colonization, but not for squatters with capital, as labour is plentiful.

AFRICAN ISLANDS.

Madagascar is a large island on the Indian Ocean, between 25° and 12° south lat.

It is divisible into the low coast-lands and the interior highlands, which are very extensive, and admirably adapted for the rearing of cattle. The low coast-land and the deep valleys on the east side are generally swampy and feverish, and deadly for Europeans. The port of Tamatave on the east coast is said to be very unhealthy; but the Bay of Diego Saurez towards the north is fairly salubrious, while the small island of Nossi-Bé, off the coast, is comparatively free from endemic disease.

The climate of the elevated interior varies with the altitude, but is generally temperate and agreeable, and, where the country is open and devoted to pasture, is free from injurious paludal disease.

The chief town, Tananarivo, is beautifully situated in the centre of the island, at an elevation of 4,000 or 5,000 feet.

The climate of Tananarivo is warm and temperate. The mean temperature of Tamatave is 78° or 80°. Much of the interior is climatically suited to European colonization, but, as the natives are numerous and industrious, poor Europeans will have no chance of success.

Mauritius lies between 19° and 20° south lat. Most of the island is hilly, and has an elevation of from 500 to 2,700 feet. The rainfall is 70 inches. The mean annual temperature at Port Louis, the chief town, which is surrounded by hills and has little tide, is 78°. During the hot season it varies from 96° to 100°, and in the interior from 80° to 96°. The cool season lasts from April to November, and from January till April cyclones often occur. Cure Pipe, elevation 1,800 feet, is a pleasant retreat. The soil is loose and rests on impermeable rock. Owing to its mountainous character, the changes from lowlands to hills, and the great heat of the former, hepatitis and dysentery have always been frequent. Thus in 1859 there were 47 cases of hepatitis in 1,254 men, while in Jamaica there was only one case among 807 men. Bilious remittent and typhoid are also frequent. Yellow fever has never been seen. Cholera occurs at intervals. Chest affections are common, but phthisis is said to be rather rare. Ophthalmia often occurs.

Reunion has a somewhat similar climate, and the Seychelles have a healthy tropical climate.

CHAPTER XI.

America, North and South—The West Indian Islands and Bermuda.

THE UNITED STATES.

Their Salubrity and Health Resorts.

This great country lies between 25° and 49° N. lat., and between 17° and 124° W. long. The States are divided into three great regions: First, the Appalachian Plateau of low elevation, with the Alleghany Mountains, and those of New York, New Hampshire, and Vermont; second, the Cordilleran Plateau, with the Rocky Mountains; and third, the great Central basin of the Mississippi and its tributaries.

The Cordilleran Plateau is further divided into (*a*) the Rocky Mountains, (*b*) the Great Basin and Basin Ranges, (*c*) the Northern or Columbian Plateau, (*d*) the Colorado Plateau, (*e*) the Sierra Nevada and Cascade Ranges, and (*f*) the Pacific Coast Region.

Of these divisions, the most important, from a climatic point of view, is the Colorado Plateau. In the State of Colorado, between 41° and 36° N. lat., the main divisions of the Rocky Mountains enclose an extensive plateau, which is split into the high mountain valleys known as the San Louis, North, Middle, and South Parks, whose elevation varies from 4,000 to 10,000 feet, and whose climate is so favourable to consumptive diseases.

The main plateaux throughout the Cordilleras are generally divided by deep cañons or ravines into smaller plateaux, called mesas, and these mesas are sometimes broad, and sometimes but narrow paths between yawning precipices.

The Great Basin is another upland plateau, at an elevation of from 5,000 to 7,000 feet, lying west of the Rockies, and characterized by the absence of any drainage towards the sea, which, on the contrary, converges to the great Salt Lake, the Cedar Pass, and the Humboldt Sink, whose elevations are respectively 4,250, 6,200, and 4,200 feet. In South Colorado, New Mexico, and many other States throughout the Cordilleran system, are other similar plateaux of great elevation.

Broadly speaking, the climate may be divided into that of the region from the east coast to the foot of the Rocky Mountains, into that of the plateaux and slopes of the Cordilleras, and into that of the Pacific Coast, with the Sierra Nevada and Cascade Ranges. It is also divisible into the climate of the Northern and Southern States.

The following Table, from Humboldt, shows the difference as compared with Europe or North America.

PLACE.	LATITUDE.	YEAR.	COLDEST MONTH.	HOTTEST MONTH.
Nain (Labrador)	57° 1′	25·16°	3·82°	51·08°
Aberdeen	57 1	46·76	37·22	57·74
St. Johns, Newfoundland	47 36	40·10	22·46	59·54
Brest	48 24	53·60	43·44	64·76
Halifax, Nova Scotia	44 4	43·34	22·64	64·4
Bordeaux	44 4	55·04	42·44	69·8
New York	40 4	51	28·9	73·3
Naples	40 4	61·7	48·2	77·1

The mean annual temperature from the Atlantic to the Rockies varies from 44° to 68°, the mean being 1°·6 for each degree of latitude. The mean of the Southern States, except Florida and the Gulf Coasts, is 68°. Ohio, Indiana, North Kentucky, Illinois, N. Missouri, and Kansas to Colorado have a mean of 52°; and this is also the mean of the Rockies for 500 miles south from Colorado. The mean of the Northern States from New England to Dakota is about

40°. The mean of the higher Cordilleran plateaux, as far south as New Mexico, lat. 34°, is 44°.

The climate of the Pacific Coast is much more uniform than that of the Atlantic sea-board, the mean annual temperature of 60° extending through South California, 52° being the mean of San Francisco in lat. 37° N. The mean of Puget Sound is 48°, and that of the Sacramento Valley 60°.

The mean summer temperature of the more northern States, from the Atlantic to the Rockies, is 68°, of the central States 75°, and of the more southern about 80°.

The mean summer temperature of the Great Basin, the plateau of Arizona, and the lower valley of the river Colorado, below the thirty-fifth degree of latitude, is 88°. Along the Pacific Coast the summer temperature is but little in excess of the annual mean. The mean winter temperature of the more southern States to Kansas, and southwards through the mountains to the Great Basin, is 32°. From San Francisco northwards along the coast the winter mean is 40°, while towards the southern frontier it is 52°. Even in the warmer parts of the country irregular bouts of cold weather occur occasionally, and in the Northern States short spells of extreme heat, which have a most enervating effect alike on man and animals, are occasionally felt.

The coldest part of the country is Montana and Wyoming, where the temperature falls to −50°, and mercury often freezes; while the greatest heat and dryness is found in Lower California and Arizona.

As regards rainfall, the entire region east of 100° of long. has a precipitation of about 26 inches. The average on the Atlantic Coast is 50 and in the south-eastern States 56 inches. Through the Cordilleras, from Nevada to the Rockies, the fall is very slight; while along the Pacific Coast it varies from about 12 inches at San Diego to 21 inches at San Francisco, and 77 inches at Astoria, in the north.

Climate of Individual States.

New York.—The climate of New York may be taken as a representative of the North-Eastern States. It is very hot in summer and cold in winter, yet healthy, stimulating, and not disagreeable. The annual mean temperature is 47°, the average summer maximum 93°, the extreme 102°, and average minimum −20° Fah. Frost occurs from the 1st October till the end of April. In the Adirondacks, elevation 5,000 feet, the winters are very severe. The great lakes are never frozen over to their centres. Along the coasts the sea equalizes the climate, and the city is warmer than the interior; while in summer the Arctic current cools the air as far as Cape Hatteras. At Buffalo the mean temperature is 46°, and the rainfall 32 inches.

New Mexico.—This State lies at an elevation of from 4,000 to 7,000 feet, and is fairly well supplied with water. The climate is dry and the air clear throughout the year. The winter temperature at Santa Fé, elevation 7,000 feet, is as cold as New York; but, owing to the dryness, the cold is rather bracing than disagreeable. The south of this State is warmer than the north. Even during the rainy season, from mid-July to September, there is hardly ever an entirely cloudy day. The rainfall at Santa Fé is 14 inches, and the mean temperature 48°·5.

The elevation of the principal towns is as follows: Costella 7,774 feet, Sierra Amarilla 7,450 feet, Glorietta, Fort Ungate, and Zasos, 7,000 feet; Las Vergas 6,450 feet, Fort Stanton 5,800 feet, Las Cruses 3,800 feet, and Albuquerque 4,900 feet. This State is most admirably adapted for tubercular and respiratory diseases.

Colorado lies between the 37th and 41st parallels. In the great parks the summer heat is 90°, but the nights even then are cool and dewless. The winters are rather mild, but snow lies on the highest inhabited hills, and in the parks sometimes to the depth of a foot, from which it soon disappears.

The air is pure, clear, and flexible, being neither too exciting nor sedative (Bayard Taylor), and between July and October there is almost no rain. Colorado has many health resorts, and the climate is of great value in phthisis, asthma, debility, neurasthenia, and to over-fatigue of mind or body. The drawbacks are the occasional occurrence of windy storms and heavy falls of hail. Its humidity is slight, and the nights are cold. There are several mineral springs, the best known of which are the chalybeate waters at Carlisle, Red Creek, and Manitou; the alkaline at Manitou, Trinidad, and Cañon City; the sulphurous at Fairplay and Idaho; and hot springs, containing soda and sulphur, at Pagosa, in the Middle Park, at Sequache, at Waggonfield Gap, and Del Norte. Manitou is the most fashionable, and contains good hotels and private accommodation.

Kansas lies east of Colorado. It is an undulating plain, has a maximum temperature of 98°, a minimum of 12° below zero, and a rainfall of 26 inches, mostly in summer.

Extremes of heat and cold are common, as in all prairie lands; yet as the nights are always cool, and breezes blow in summer, it is a most healthy State, and is well suited to young poitrinaires.

In Georgia the northern highlands possess a good summer climate for consumptives, the centre and south are very hot and oppressive, and the coasts are swampy, malarious, and subject to yellow fever.

California.—The winters are dampish, with slight snow in January, and heavy rains in February. The rain ceases in April, and the heat increases till September, with strong daily winds, and calm, clear, and dewy nights. The climate is highly salubrious and enjoyable, and well suited to the exhausted and debilitated; and in the centre, and particularly the south, to consumption. Paludal fevers occur in the Sacramento Valley, and typhoid, rheumatism and chest affections are very common. In Pennsylvania, though the northern highlands are rigorous, the south and centre enjoy a pleasant climate throughout the year, the extremes of heat

and cold being generally short. The extremes run from zero to 100°. Philadelphia has a genial and fairly equable climate. In South Carolina the high pine lands are healthy, and afford a safe retreat in summer from the fatal fevers of the coasts and lowlands. The centre, unless along the swampy creeks, is healthy.

Louisiana has a mean temperature of between 60° and 70°, the mean of the hottest month being 85°, and of the coldest 45° to 60°. The highest temperature in summer is 105°. The rainfall is 60 inches, with great humidity.

New Orleans is a hot unhealthy place in summer, and the coasts are subject to yellow and malarious fevers.

Florida.—The climate of the north is temperate, of the middle region semi-tropical, and of the extreme south fully tropical.

In the north cotton, wheat, and cattle are largely raised, but no oranges, as the winter frost is fatal to their fertility. In the middle region oranges, lemons, and figs as well as cotton and sugar canes abound. In Florida there are two seasons, the wet season in summer, and the cool and dry one in winter. Orange County is the highest as it is the healthiest part of the State, endemic fever being almost unknown; the climate of this part is noted for its great equability and freedom from sudden changes. From September till April it resembles the Indian summer of Canada, and even during the rest of the year the temperature is not higher than 95°. The nights also are generally cool, and the summers, though longer, are never so hot as in northern States of the interior. Mosquitoes are rarely troublesome, and sandflies, so common in other parts of the State, are unknown. Over the whole of Florida the wintry winds are easterly, and, while invigorating and healthy, are never irritating or harsh; the relative humidity at this season also compares favourably with the Riviera and Minnesota.

The Orange and Volusia counties are the best for invalids, as well on account of the climate as by reason of the superior hotel accommodation.

Except along the northern and southern swampy regions, Florida is a healthy country, and the northern and higher middle portions are adapted for European colonization; it is also suitable as a permanent residence for those with a weak circulation, or who from any cause are unable to stand the rigours of a northern winter. The higher and drier parts, already indicated, are well suited during winter to throat and chest affections, and to phthisical cases, particularly of the more irritative type.

The principal winter resorts with good hotels are Jacksonville, Palatka, Sandford, Enterprise, Titusville, Halifax, Port Orange, New Britain, Daytona, Quincy on the hills, Madison, Waldo, Lake City, and De Ferriak springs in West Florida.

Malarial fevers are common along the St. John's river and on the southern seaboard.

Seaside Resorts and other Health Resorts.

The principal seaside resorts proceeding southward along the Atlantic are Newport, Long Island, and Long Branch. Atlantic City, and Cape May, near Philadelphia, possess a mild winter climate, and are much frequented, not only in summer but from January till April. Savannah, St. Augusta, Fernandino, Pensacola, and Mobille enjoy a mild winter climate. On the Pacific coast the principal stations are San Diego, Coronada Beach, Monterey, Del Monte, Santa Barbara, Santa Monica, and Santa Cruz.

San Diego with Coronada Beach has a beautiful dry, warm, and equable climate throughout the year, the mean temperature being 62°, seldom rising to 80° or sinking below zero; the rainfall is 10 inches. This station, and others in Lower California, are well-adapted for weak-chested young men, who may expect not only to stave off active disease, but to succeed as permanent residents. San Diego is a prosperous town, and has first-rate hotels.

Santa Raphael near San Francisco, though colder, has a

good climate for poitrinaires. Northwards towards the Canadian frontier are many summer resorts, and a summer trip to Alaska over pacific seas, guarded by a fringe of outlying islands, is as delightful as it is salubrious.

On the interior lakes are also many resorts, the principal of which are Niagara, and numerous places on the beautiful lakes Champlain and George, Great Salt Lake City, and Garfield Beach, and the lakes of Minnesota.

Mountain Resorts.—The mountain resorts, besides those already mentioned, are to be found with good accommodation in summer in the Adirondacks and Catskill hills in New York.

Winter resorts are Southern Pines (North Carolina), Camden, Sommerville, and Aiken (South Carolina), and Augusta (Georgia). These places possess good accommodation, and a fine, warm, moderately dry, and pine-scented atmosphere. Other places are St. Paul's, Minneapolis, Redwing, Winona, Frontenac, and Fairbault, in Minnesota. These stations are all more or less sheltered, have an elevation of about 1,000 feet, and possess a cold clear air and good accommodation. They are most suitable for the bacillary and hæmoptyic forms of phthisis.

In Texas, Austen City and San Antonio are large cities, with a fine, dry winter and spring climate, while El Paso, at an elevation of 4,000 feet, has a remarkably bright, dry, pure, and salubrious air.

In the Rockies are Santa Fé (New Mexico) and Denver City, Las Animas and Trinidad in Colorado. Southern California possesses the beautiful inland resorts and cities of Los Angelos, Pasadina, San Bernardino. These places have a fine dry climate, with capital accommodation.

Mineral Springs.

The American mineral springs are nearly as numerous as those of Europe. The most famous are the saline springs at Saratoga, N.Y., the hot springs of New Mexico and Colorado, the sulphur waters of Virginia and Florida, and

the celebrated Yellowstone springs and geysers in Wyoming Territory.

Salubrity.—To sum up, the climate of the States is mainly characterized by great summer heat and winter cold. Ice and snow continue in the north and centre from November till April. The summers are short, with a clear and uniform atmosphere. The great cold of the north is partly due to the elevation and the number of frozen lakes. In Maryland and Virginia the summers in the swampy lowlands are very oppressive, with paludal fevers, bilious remittent and dysentery. The higher parts are healthy. Alabama has a very hot but, unless on the coasts, a healthy climate. In Indiana the winters are very short, but severe. Ohio is less uniform. The river is solidly frozen at Cincinnati. Illinois has a short winter and a temperate climate. In general the west, though as cold as the east, is drier, and less subject to sudden changes and variable weather. The salubrity of the Northern States is equal to Western Europe, the death-rate of the chief towns being 18 or 20 per 1,000. Of this mortality 28 per cent. is due to chest affections, 21 to digestive disorders, 14 to phthisis, and 5 to fevers—paludal, eruptive, and typhoid. Intermittents are most frequent along the banks of the great lakes, but these, as well as remittents, occur in New York and most of the Northern States. The infant mortality is heavier than in England, and one fourth of the children die in the first year of life. The British and Irish labouring emigrants do not bear well the extremes of the States, and those who are compelled by necessity to continue as labourers in the fields rarely survive beyond their forty-fifth year.

The Southern States lie south of a line drawn through Richmond (Virginia), St. Louis, Kansas, and on to San Francisco. Here the military mortality from 1829 to 1838 was 4·9 per 100 as compared with 1·8 in the north. The diseases are fevers, diarrhœa, dysentery, abdominal disorders, and affections of childhood. Ague, remittents, and yellow-fever occur along the Gulf coasts, and the autumnal

remittents cause about a third of the army mortality in the south. Yellow fever also extends to the Atlantic coasts of Florida and Georgia, and has even reached on one or two occasions New York, Boston, and Quebec.. Infantile cholera is very fatal. Chest affections and phthisis are rare, but fatal.

The subjoined table from the U.S. Army Statistics shows the relative distribution of tubercular and respiratory diseases in the States :

Tubercular Affections.	Per cent. of deaths.	Other Respiratory Diseases.	Per cent. of deaths.
New England	25	West Florida	6·9
Minnesota	14	New York	5·9
Southern States	6	New England	4·8
New Mexico	3	Great Lakes	4·5
		Texas	4
		West Texas	3·9
		East Florida	2·3
		New Mexico	1·3

DOMINION OF CANADA.

The climate of Canada, which extends from 42° to 75° N. lat., is extremely rigorous, especially towards Hudson's Bay, where the soil never thaws. After Hudson's Bay district the coldest provinces are Manitoba, Saskatchewan, and Quebec, and the least cold Ontario and British Columbia. There are but two seasons — the short, dry, hot summer, with its continuation into autumn as the beautiful Indian summer; and the prolonged winter, with snow on the ground from November till April or May. In Manitoba the summers are hotter and the winters colder than in Ontario or Quebec, and the Indian summer more lovely, owing to the prairie fires, than elsewhere. As compared with Ontario and the maritime provinces, the winters in the north-west, though extremely cold, are dry, crisp, and invigorating, no feeling of rawness being ever experienced. In British Columbia, on the Pacific side, the climate is humid and mild. The climate of New Brunswick and the other maritime

districts, though cold, is more equable than that of the interior. Newfoundland, particularly on the east coast, has a temperate though foggy climate. Unlike Canada, open fires are sufficient to heat the houses, and exercise can be taken throughout the year.

The following table shows the climate of the different provinces :

PLACE.	ANNUAL MEAN.	MEAN OF COLDEST MONTH.	MEAN OF HOTTEST MONTH.	RAINFALL, INCHES.
Ontario	44°	22°	88°	25
Quebec	40°	16°	90°	26
Nova Scotia	39°	23°		33
New Brunswick ...	39°		79°	
Newfoundland ...	41°	26°	83°	58
Manitoba	32°	1°·5	96°	16
British Columbia ...	48°	26°	96°	58
Nain, in Hudson's Bay	25°	4°	52°	

Canada is a healthy country, and well adapted to Europeans. The prevailing diseases are acute chest and throat affections, scarlatina, dropsy, diphtheria, and, in Newfoundland, rheumatism. Ague occurs in the swamps. Typhoid fever is rare, and consumption, unless in the coast districts, is an uncommon disease.

MEXICO AND CENTRAL AMERICA.

These districts lie between 8° and 33° north lat. Three-fifths of Mexico are occupied by the high plateau of Anahuac, situated between the eastern and western expansions of the Cordilleras, whose elevation varies from 6,000 to 8,000 feet above the sea. The average elevation of the plateau of Guatemala, in Central America, is about 5,000 feet. These plateaux incline gently towards the Gulf of Mexico, while in the west the descent is rapid, and the mountains almost abut the coast.

The climate depends on the altitude, and is divided into the hot, the temperate, and the cold. The hot comprises

the sandy, marshy, and barren lowlands, and the hills to the height of 2,500 feet. The mean annual temperature at Vera Cruz, in this belt, is 80°, that of the coldest month 70°, and of the hottest 84°. The extremes are from 61° to 98°, the relative humidity about 80°, and, though July is the hottest month, there is no marked dry season. Violent disease-dissipating winds occur in autumn.

The temperate region extends from 2,500 to 5,000 feet, and includes the towns Jalapa, Cordova, Tasco, and Orizaba. The mean annual temperature is about 67°, and there is great mildness and uniformity, extremes of heat and cold being unknown. The humidity is between 90° and 95° per cent., with mists and torrents of rain (100 inches). The rains begin in June and end in October, and fall regularly from 2 p.m. till midnight.

The plateau is reached at Cumbres, whose elevation is 6,000 feet, and, after rising to 8,000 feet, falls towards the centre, where lie the valley and city of Mexico. The mean annual temperature of this fair city, whose elevation is 6,700 feet, is 61° ; the mean of January 53°, and of June 66°. The difference between the day and night temperature is great, extending in winter from 33° at night to 69° at 2 p.m.

The air is mild and very dry, the sky limpid and clear, and the summer heat is modified by the rains, which occur principally at this season, but which are fully one-half less than in the temperate region. Above 8,000 feet the rainfall is five times less than on the lower hill-slopes, and perpetual snow is not found lower than 15,000 feet above the sea. The north-western parts of this country are in the rainless region, and the further we go north on the plateau the drier the climate.

Over the whole country the rains begin on the east side, and on reaching the Pacific are deflected north to the shores of Lower California and British Columbia. The dry season lasts from January to July in Mexico, and from November till May in Central America, when the air is pure and dry,

with heavy dews at night. In the wet season prolonged calms, with storms and great humidity, give rise to malaise and ennui. Earthquakes are frequent. Yucatan, Honduras, and Belize are drier than the other lowlands, and are not unsuitable to chest affections in winter.

Salubrity and Diseases.—The eastern lowlands are unhealthy, yellow fever being endemic at Vera Cruz and the gulf ports. It rarely, however, extends above the lower mountain slopes. After yellow fever comes paludal diseases and their sequelæ. Other diseases are tetanus, dysentery, and phagedenic ulcers. On the slopes the diseases are mild intermittents, dysentery, diarrhœa, and hepatitis. The most common affections on the plateaux of Guatemala and Anahuac are eruptive fever, the typhus fever of altitudes, called *Tarbadilla*, acute chest affections, diseases of childhood, phthisis, dysentery, diarrhœa, dropsy, and cerebral apoplexy.

Syphilis, with articular rheumatism and endocarditis, is also exceedingly prevalent. On the west coast malarious and bilious fevers occur in the south, but are rare in the dry northern parts; yellow fever is very rare. The more northerly towns on the plateau of Anahuac are well suited to consumption.

Health Resorts.

Since the multiplication of railways the number of American winter visitors to Mexico has greatly increased, and, as the hotel accommodation is also improving, many English may follow their example. To the tourist, the archæologist, the botanist, the historian, the ethnologist, the speculator, as well as to the invalid, Mexico is a land of surpassing interest. On entering, the visitor should not remain at Vera Cruz, but ascend to Jalapa, Cordoba, or Orizaba, where he may remain for a short time to get accustomed to the rarified air.

Puebla has an elevation of 7,200 feet, and is a fine town, close to the celebrated volcano of Popocatepetl. The

climate of the city of Mexico varies little between summer and winter; the air is very rare, dry, and trying to the unacclimatized.

Monterey, 170 miles from Lareda, on the American frontier, is much resorted to by Americans in the winter season. It possesses a warm, dry, and healthy climate.

Santa Rosalia (4,022 feet) is a fashionable resort with mineral springs.

Chihuahua, in North Mexico (4,690 feet), has a dry, fine climate in a rich pastoral district.

Aguas Calientes, in Central Mexico, is resorted to for its hot springs. The rainy season on the plateau of Anahuac is from June till October.

SOUTH AMERICA.

Equador, Colombia, Venezuela, and Guiana.

These countries extend from 12° N. to 4° S. lat.

On the west the descent from the plateau is rapid, while on the east it is gradual, through the great plains of Brazil and Venezuela. The mean elevation of the Andes in Colombia and Equador is 11,000 feet, and amid these lofty highlands are numerous beautiful valleys and plains, higher above the sea than some of the highest mountains of Europe. The principal are the high valleys of Quito and Bogota, which are held in great repute for the cure of consumption. The valley of Quito differs from the plain of Anahuac and most other mountain resorts—1st, in possessing a more equable climate, because of its equatorial situation; 2nd, in being drier, because of its great elevation and location on the rain-protected side of the Andes; 3rd, in being well protected by sheltering mountains. The temperature, according to Dr. Domec, oscillates all the year round between 57° and 65° Fahr. The climate of the highlands of Colombia is also cool and pleasant, but Santa Fé de Bogota, owing to local condensing hills, is exceptionally humid and wet.

In the low sandy and marshy coast-lands towards the Atlantic side the heat is excessive and the dampness ex-

treme. In this region malarial fevers are frequent and severe. The coast towns, Maracaibo, Carthagena, and Colon, are hot, damp and unhealthy. Caracas is less so. Besides Quito and Bogota, there are the health resorts of Riombata and Ambato, on the west slopes of the Andes, between Quito and the port of Guayaquil. Houses are to be had in these places, but no suitable hotels. Consumption is rare in Quito and the two lower stations, but scrofula is prevalent. Guayaquil is fairly free from fevers.

The Panama Canal district is one of the hottest, wettest, and most feverish regions in existence. Rain falls incessantly from June to December, and a good deal at other times as well. The climate has been very fatal to the officials and labourers engaged on the canal works.

The climate of British Guiana is also very damp. There are two wet seasons, one commencing in January and the other in June, the latter being the longest. The mean temperature at Georgetown in summer is 86°, and in winter 82°. The rainfall is 160 inches, some falling in every month. September and October are the driest months in Guiana, and April and May in the llanos of the Orinoco. From this it will be seen that the climate is exceedingly equable, there being but little difference between the seasons.

In the highland plantations the climate is more equable and salubrious. The prevailing diseases in the lowlands along the Atlantic seaboard, in the countries under consideration, are malarial fevers, dropsy, splenic and hepatic enlargements, mild dysentery, yellow fever periodically (every ten years), leprosy, and phagedenic ulcers. Severe hepatitis is rare. Unless in the highlands of Colombia and Equador, these countries are totally unsuited to European colonization. As planters, merchants, and officials, Europeans will probably suffer no active disease, except mild fevers, at least for three or four years, after which time they should return to Europe. Guiana and the other lowlands are quite unsuited to consumptives, as well as to parturient women and all young Europeans. In French Guiana,

owing to malarial influence, the European women soon become barren and the men impotent, and the rearing of European children is almost impossible.

Brazil.—The characteristics of this great country—which is sixteen times as large as France, and extends from 4° 30′ N. lat. to 34° S. lat., and whose breadth from east to west is 2,300 miles—are large navigable rivers connecting splendid harbours with the interior, high mountain ranges tempering the climate, and vast marshes, forests, and extensive plains.

The climate differs materially in different parts of the country. The great northern lowlands within the tropics possess a very hot and moist climate. On the elevated southern tropical highlands the climate varies considerably, while towards the extreme south it is comparatively cool, with four seasons, heat, however, being still the predominating element.

In the northern flat region the highest temperature is 90°, and the lowest 75°. At Para, lat. 2° S., the annual mean is 80°; the maximum 95°, and the minimum 68°. At the falls of the Madeira River, in the far west, the mean is 77°, and the variations are slight; but at Rio de Janeiro, the capital (lat. 23 S.), the mean is 75° in January and 65° in July. In the Rio Grande do Sul, the most southern province, the mean of summer is 70°, and of winter 50°; while on the high plains in this province, and also on the eastern highlands, ice and frost are not infrequent.

The climate throughout the country is greatly influenced by the amount of rain and the duration of the rainy season.

The wet season along the basin of the Amazon in the north is from December till May and July, while the rest of the year is fairly dry. Rain, however, occurs throughout the year. This region extends southwards to the town of Maranhas, in lat. 3° S., where the average rainfall is about 23 feet. At Pernambuco July is the most rainy month, while at Bahia, Para, and Ceara April has the heaviest fall. Across the higher southern watershed of the Amazon,

from Maranhao, Acuna, Goyaz, and North Matto Grosso to the falls of the Madeira, the rainy season is from October till March. Along the north-east coast, through Ceara, Rio Grande del Norte, Pernambuco, and North Bahia, the rainy season is from March or April till August. The coast from Southern Bahia to San Paulo and the valley of the San Francisco has a double rainy season, the greater being in April to May, and the lesser in October. The rainfall at Pernambuco is 100 inches, and at Rio 60. In San Paulo the rainy season is from November till April. South of San Paulo the rains are irregular, and the four seasons begin to be distinguishable.

Salubrity.—Except along the marshy river banks and in swampy districts, the country, for a tropical one, is healthy, the mortality of the chief towns being as low as in Europe. It is, however, no country for emigration or colonization by the labouring natives of Northern Europe. From Bahia south the coast towns may be considered healthy, as may also Pernambuco, situated on a promontory in lat. 8° 3′ S. The climate is hot and humid along the north-eastern coasts, the heat being rendered tolerable by the rains, the sea-breezes, and the purity of the air. At Rio the humidity varies from 42 to 100 per cent., and the average number of wet days are 84. Southwards in the interior, towards the Argentine, the climate is cooler, drier, and more extreme.

The sub-tropical southern parts are not unhealthy, and Europeans, if not obliged to work hard in the field, soon get used to the climate.

The most prevalent disease in Brazil is phthisis, which carries off about one-sixth of the people of every colour, and is said to be as prevalent at Coritiba, in Parana, at an elevation of 2,000 feet, as in the lowland tropical coast districts (Sigand). Other common diseases are affections of childhood, paludal fevers, bilious remittents, yellow fever, typhoid fever, dysentery, hepatitis, hematuria, chyluria, ulcerated proctitives, yaws, leprosy, erysipelas, gastric fever, small-pox, beriberi, and filaria sanguinis hominis.

Speaking of Pernambuco and the north-east coast towns, Dr. Day, now of Redcar, who formerly practised in this country, says that yellow fever is not considered as contagious, but a fever form of malarious disease. Beriberi is a remarkably common disease, for the cure of which removal from the country is necessary. European children should return to Europe on attaining their fifth year, up to which age they do as well as at home.

European residents of all ages in the damper and more tropical parts should take a holiday to a temperate climate every three or four years; but there are many who do not do so, and yet get on very well for a number of years.

Health Resorts.

The principal health resort is San Paulo, which is a cool and pleasant retreat, at a considerable elevation, and is well adapted to the needs of consumptives and other invalids from the lowlands. There is ample accommodation for invalids, and an English medical man. The wet season is, however, in summer, corresponding to our winter. Other health resorts exist in the hills close to Rio, Bahia, and other large coast towns, and form an agreeable resort to the citizens in hot weather.

Brazil is not suited to youths with a consumptive tendency.

PERU AND BOLIVIA.

Peru and Bolivia are traversed from north to south by two parallel chains of mountains, with numerous cross ridges and lofty summits rising to the height of 24,000 feet, the snow-line being 16,000 feet. Between the Andes and the Pacific is the desert of Atacama, while on the east the mountains slope gently to the wooded plains of Brazil. One-third of these regions are mountainous. Speaking of Peru only, we may say that the extensive upland valleys of the interior enjoy a cool and temperate

climate, while the shores of the Pacific are not so hot as from the latitude, we might be inclined to suppose.

The heat of the sun is tempered by the fogs and breezes, and sometimes, when the strong westerly winds blow, although the sky is cloudless and the sun shines brilliantly, the air feels as chilly as on the snowy mountains. Earthquakes are remarkably common. The coast region, except the more northerly part, is a barren desert, and is very dry, the rainfall being scanty. The high interior valleys have much less rain than the eastern slope of the tropical Andes or the western slope between 10° N. and 4° south lat. From November till April there is constant dryness with clear sky, but not oppressive heat. From June to November fogs and mists prevail. The mean annual temperature of June is 70°, of February 78°·5, and of July 61°·4. The towns on the western slopes of the mountains possess an agreeable climate up to 10,000 feet elevation, while those on the eastern side are apt to be wet.

Health Resorts.

Janga and Huancayo are the principal mountain health resorts, and are well frequented by poitrinaires from Lima. They possess an elevation respectively of 8,000 and 10,000 feet, and enjoy a pure, clear, bright and equable climate.

Salubrity.—Peru, though a hilly country, is far less salubrious than Brazil, the mortality being 50 per 1,000.

The most prevalent and fatal disease here, as in Brazil, is phthisis. Dysentery, often complicated with hepatitis and hepatic abscesses, causes one-fifth of the total mortality.

Malarial fevers, simple and grave, are remarkably common, and yellow fever occurs once in a decade. Small-pox and skin diseases are also common. Veruja, a species of moluscum or bleeding wart, is confined to the westward slopes of the high interior valleys round the town of Santa, eleven leagues from Lima. It is not contagious, and is probably caused by the waters of the hills, and is more prevalent among Europeans than natives.

Bolivia is in lat. 10° to 23° S., and its western part is the most mountainous country in America. The highest region, above 12,500 feet, is called the Puna Brava; it is uninhabited. The Puna lies between 12,500 and 11,000 feet, and consists of the higher sparsely peopled plains. The next division comprises the upper valleys trending towards the lowlands from 11,000 to 9,500 feet. Here the climate is temperate and suitable to the growth of wheat and vegetables. Below this is the valley proper, called also the Medio Junga, between 9,500 and 5,000 feet. The temperature falls but slowly from the sea-coast up to the great highland valleys, but from those valleys, upward to the higher mountain regions, very rapidly. Lower still is the Junga, a low-lying region below 5,000 feet; with tropical vegetation.

The climate of the Puna Brava is very severe; that of the Puna cold and dry, with a high solar temperature, accompanied with cold winds from the dominating peaks. The climate of the Valle and Upper Junga is delightful, with warm days and cool nights. The rainfall depends on the slope of the Andes—the west side being almost rainless, but the east has a varying supply, according to elevation. On the higher ranges, snow takes the place of rain, but in the Puna and upper valleys the rains begin in November and end in March, with frequent storms of hail and snow. In the lowlands the rains are irregular, but mainly in summer. The principal towns are Potosi, La Paz, Cochambaba, Sucre, Orura, in the highlands; Tanja in the south, and Santa Cruz in the eastern plain. Illimani, in the eastern chain, is 24,000 feet high and 18,000 feet above the neighbouring valley. Some of the western peaks are 22,000 feet, and many of the passes are in the line of perpetual snow, which is here about 16,000 feet. The eastern portion is comprised of immense plains, forming the upper basins of the Madeira and La Plata rivers. The climate of Potosi, whose height is over 13,000 feet, is keenly cold at night, cool in the morning and forenoon, scorching in the afternoon, and mild, calm and lovely in the evening.

The valleys from 4,000 to 9,000 feet on the western side are well suited to consumption; but the Puna is too changeable and harsh for sufferers from asthma, consumption and other respiratory diseases.

The uplands above 5,000 feet are adapted for European colonization, and must be considered as healthy, temperate countries.

The city of La Paz, 12,000 feet above the sea, in lat. 30° S., is too high and harsh for invalids, and the same may be said of Potosi.

New-comers at first have difficulty in breathing and are apt to suffer from dysentery, unless they are careful in their clothing and the use of flannel belts. The respiratory difficulty soon disappears, and, generally speaking, the climate of the higher region is not insalubrious. Snow-storms are attended, as in the Arctic regions, with snow-blindness, which may prove fatal, and typhus amarilla is very fatal in the Puna, as are also chest affections among children, while adults suffer more from these affections in the Vall and Junga. Towards the coast and on the eastern plains every kind of climate is observed.

ARGENTINE REPUBLIC.

This progressive State lies between 22° and 41° S. lat. It is almost entirely an immense plain from the Atlantic to the Andes, and from Patagonia in the south to Brazil in the north. From east to west this plain is divided first, into a region of thistles and alternating clover; second, into a region of sand and grassy pampas; and third, into a barren region almost to the foot of the mountains. The climate of the far west is warm and dry till we reach the slopes of the mountains, where rains are of frequent occurrence; that of the central pampas is wet, while the eastern sea-girt portion, including the province of Buenos Ayres, is one of the most humid and variable on the face of the globe, the changes being brisk and frequent. The mean annual temperature of the city of Buenos Ayres is 61°, the

mean of January 79°, and the mean of August 51°, while the extremes vary between 96° and 35°, the thermometer often falling in a few hours on the result of storms, which are frequent, as much as 50° or 60°. From July to December fogs and rain are apt to prevail, but during the rest of the year the sky is bright, the atmosphere clear, and, though rain is not so heavy as in winter, heavy dews supply its place. Autumn—from March till June—is the most pleasant time of the year, but the summer, though hot, is generally breezy and agreeable.

The alternations of heat and cold are great in the interior plains, and dry cold winds, called pamperos, blow with considerable violence. The northern part of the country is exceedingly hot, and in many districts subject to inundations, and should be left to Italian and other emigrants from Southern Europe.

Salubrity.—The Argentine Republic is, on the whole, a healthy and, through the greater part of its extent, a temperate country, suited to European colonization, the mortality being about 25 per 1,000. The prevailing diseases are consumption, diseases of childhood, hemorrhagic phthisis, measles, small-pox, whooping-cough, chest and throat affections, rheumatism, neuralgia, sciatica, nervous complaints, and ulcers. On the other hand, malarious fevers are mild and infrequent.

The Argentine should be avoided by poitrinaires. There are, however, many suitable stations for consumptives on the north-western plateaux and mountains.

PARAGUAY.

This small inland country lies between the Paraguay and Parana rivers, between 22° and 27° south lat. It is mostly of plateau formation, with an elevation of from 1,000 to 2,000 feet. Asuncion, the capital, is built on a plain, whose elevation is 200 feet, on the Paraguay River, which in this region is subject to inundations. The hot season extends from October to March, and the cool for the rest of the year. The mean annual temperature is

75°, and the rainfall about 60 inches, falling on 84 days. Bracing south winds blow for over 100 days in the year, and hot winds for about as many days in summer. It is a healthy country, but too tropical for consumptives or north European colonists.

URUGUAY.

Uruguay lies between the ocean and the Uruguay and La Plata rivers, between 34° 5′ and 30° 5′ S. lat. It is a healthy, pastoral country, well suited to European colonization, and is made up of rolling, slightly elevated places and scattered hills. The winter climate is cool, wet, and variable. The climate of Monte Video, the capital, is similar to that of Buenos Ayres, except that it is eight degrees cooler in the hot season. It cannot be recommended to consumptives.

CHILI.

Chili is a narrow strip of mountainous country on the Pacific slope between 20° and 56° S. lat. The soil is exuberantly fertile, producing almost every tropical and temperate product in abundance.

As it extends from the Atacama desert in the north to the wet regions of the south, and as the elevation varies from the snow-line to the level of the sea, the climate is necessarily one of different types. In the extreme south cold and damp predominate, yet it is healthy and fertile. The southern district of Llanquehué is moister, but somewhat warmer than the Scottish highlands; while the provinces of Chiloe, Valdivia, and Arauco resemble the western districts of England. The annual mean temperature at Valdivia is 53°. In the more northern districts, from latitude 37° to 28°, including Conception, Santiago, Valparaiso, and Aconcagua, the climate is drier, the rainfall occurring principally in June, July, and August. The rainfall at Santiago is 55 inches, and at Valparaiso 58 inches. Further north the rainfall decreases from 5 inches at Coquimbo to fine showers at Atacama. In summer, through the central districts, hot days are succeeded by

cold nights, and south, dusty winds blow strongly till evening. These winds render extremely cold the exposed and barren places, while the temperature of the sheltered valleys may be over 80°. At Valparaiso the mean temperature is 15° Cent., the mean of July 13°, and of January 18°. The annual variations are slight; but the daily are immense, sudden, and difficult to stand. Owing to the effect of cold sea winds, and the rocky soil in the exterior, in North Chili the heat in the interior at 1,500 feet is not greater than the coast at the sea level. The same thing occurs in California in summer.

Diseases.—The most fatal diseases are dysentery, with indurations and suppurations of the liver, rheumatism and heart diseases, the result of the great heat, cold winds, and variability. Throat and lung affections, as well as consumption, are very frequent, and the latter runs a very rapid course. On the whole the climate is healthy to the careful and vigorous, but exceedingly dangerous to those predisposed to lung and liver complaints. Intermittents and remittents are rare; but typhoid, gastric, and eruptic fevers are common enough.

Quilotta, lying in a beautiful sheltered valley near Valparaiso, is the principal health resort for consumptives.

WEST INDIAN ISLANDS.

These islands lie between 10° and 25° N. lat., off the Atlantic coast of America from Florida to Venezuela. The climate varies somewhat with the different islands. The interior of most of these islands is mountainous, all are of volcanic origin, and the soil is fertile.

Cuba, Porto Rico, and other northern islands are one degree colder than the smaller ones, the climate of which is more equable and healthy. In all the islands the climate is much less enervating than might from their latitude be imagined.

The mean of the smaller islands is 79°·8, mean of August 81°·7, and of January 78°. The wet season lasts from July to October inclusive, and the dry from December to May.

There is rarely a month without some rain. The relative humidity is about 80 or 90 per cent., and the rainfall about 55 inches. The north wind blows strongly in the dry season, and the south in the wet. The hills are cooler, drier, and more healthy than the lowlands, and diseases contracted on the plains are relieved in the mountains.

The mortality among Europeans, at least among old residents, is much greater than in Europe. Still, were it not for the periodic incursions of yellow fever (once in seven or ten years), these islands, for tropical countries, would be very healthy. Yellow fever has never ascended to Camp Jacob, 1,600 feet high, in Martinique, and but very rarely to the hill stations in Jamaica. Malarious fevers are the most frequent, and dysentery the most fatal disease. Hepatitis, at least, hepatic abscess, is rare. Diphtheria and croup are common.

The most frequented winter *health resorts* for poitrinaires and Americans who wish to escape the cold winters of the north are Matanzas and Havana on the coast of Cuba, and Puerte Principe in the interior; the Isle of Pines, south of Cuba; the hill station of Newcastle, and Kingston, in Jamaica; Charlotte Amélie, in St. Thomas; and Christiansted, in St. Croix. These stations are best in December, January, February, and March. Newcastle is very useful in summer.

THE BAHAMAS.*

The Bahamas are a group of islands running for six hundred miles between the coast of Florida and the island of St. Domingo. They lie between 21° 41′ and 28° 34′ N. lat. These islands are low-lying, the highest hill being only 230 feet above the sea. The principal islands are New Providence, the capital of which is Nassau, with a population of 8,000, and San Salvador, remarkable as the spot where Columbus first landed, October 12th, 1492.

The climate is remarkably salubrious, the death-rate

* These islands are of coral formation, have a sandy soil, and are without any marshes.

being only 17·9 per 1,000, although about one-third of the people are whites. As regards temperature, the highest maximum in January is 75°, mean 70°, minimum 66°. In July the maximum temperature is 82°, mean 81°, minimum 75°. From May till October is the rainy season, when the precipitation is heavy, with considerable humidity; but from November till April the climate of New Providence is delightful, the air being pure and remarkably salubrious.

There are no diseases to speak of, with the exception of consumption, which is very fatal, both here and in the West Indian Islands, especially to the negroes. Many Americans winter at Nassau, and the climate is charming for all troubled with irritative chest affections.

THE BERMUDAS.

The Bermudas, in 32° 20′ N. lat. and 64° 50′ W. long., lie in the Atlantic, about six hundred miles from the American coast of North Carolina. There is a coral reef to the north. They are of a granular limestone formation, the surface-soil being of red earth mixed with vegetable matter and coral sand. There are no streams or fresh water, the rain-water stored in tanks being used for drinking. The climate is hot, equable, and humid. The mean annual temperature is 74°, of the hottest month (July) 83°·5, of the coldest month (February) 64°·5. Mangroves abound on the coast, yet malarious fevers are rare. Yellow fever often visits Bermuda, and mild typhoid, continued and dandy fevers, with dysentery, ophthalmia, and tubercular diseases are rather frequent. The climate is healthy, and much of the sickness in the past was due to the bad sanitary state. They are reached by Halifax and New York. The chief port is St. Georges. The largest island is Bermuda, which is sixteen miles long, and one and a half in breadth. The capital of the group, called Hamilton, is on this island. It possesses good hotels and pensions, and has a population of 15,000. St. Georges is on the island of the same name. Though larger than Hamilton, it does not possess such good accommodation.

CHAPTER XII.

Oceania, including Malasia or the Indian Archipelago—Melanesia, Polynesia and Australasia.

MALASIA AND MELANESIA.

The climate of Malasia is very hot, moist, equable, and relaxing. The heat, however, is never so great as in India or Hindoo-China, but there is no cold season to speak of.

The mean annual temperature at Batavia, the chief city of Java, and which may be taken as representing the lowlands of the Indian Archipelago, is 77°·6 in winter and 79°·3 in summer. The mean of May, the hottest month, is 80°·3. In the smaller islands of Padang and Pallenburg the annual mean is 73°·2, that of the coldest month 73°·8, and of the hottest month, May, 76°·1.

The seasons depend on the situation with reference to the equator, which passes through Sumatra and Borneo, south of the Philippine and Caroline Islands, and north of Java, Celebes, and the Moluccas.

The rains are heavy, and fall in every month, but the heaviest fall in the summer season.

Salubrity.—Borneo and New Guinea, in Melanesia, are the most unhealthy of all these islands. Timor is less so. The west coast of Sumatra, and the thick jungles of the interior are deadly to Europeans. Java, between 6° and 8° south, is thickly occupied, well cultivated, and fairly salubrious; and Batavia is a beautiful, well-drained city, with 100,000 inhabitants. The high part of Batavia is healthy and not disagreeable, and the mortality of the

troops has been reduced from 30 per cent. per annum to 4 per cent. Amboina is very malarious; but the Moluccas are looked upon as a sanatorium for the other islands.

New Guinea, between the equator and 10th parallel S., is a very fertile country. The swampy coast-lands rise into rolling grassy plains, and these into wooded hills, dominated by several chains of lofty mountains (13,000 feet). So feverish is this island, that the Rev. Mr. McClaren tells us that no one, not excepting the acclimatized Queenslander, escapes. Women and children are especially liable. Of the white visitors, in no way exposed to the work of the regular colonist, so many died that the rest were glad to get away as soon as they could. Improvement, we may hope, will follow cultivation, settlement, and drainage.

The most fatal disease in these islands is consumption, followed closely by abdominal affections, as dysentery, diarrhœa, cholera, and ague. In the Philippines the remittents are more fatal than cholera, and acute chest affections, rare in Java, are common; dysentery and cholera are more fatal among the blacks than the whites. Paludal fevers prevail at Singkel, in Sumatra, Padang, Pulo, on the north-west coast of Java, at Batavia, Buitengorz, Samarang, Sorrebayo, Madura, and Banjoewangi; along the east and south of Borneo, on the east coast of the Celebes, in the Moluccas, Amboina; also in the Nicobar, and Andamans, appertaining to British India.

There is comparative freedom from endemic fevers along the north coast of the Celebes, Macassar, Kussa, the Palembang banks in Sumatra, Riou, Linggas, and Manilla.

Small-pox is common in Borneo, Moluccas, Timor, Amboina. Scarlatina is rare throughout the Archipelago; but leprosy, elephantiasis and ulcers, and most other tropical diseases, are common. These regions are unsuited to chest affections.

POLYNESIA.

According to the accounts given by the Rev. J. Whitmee and others, the Polynesian Islands enjoy a climate infinitely

more temperate, pleasant, and salubrious than their proximity to the equator would indicate. It, however, presents considerable differences, owing to local peculiarities and to the immense extent of ocean over which these islands are scattered.

The average heat is about 80° Fah., and it rarely falls below 60°; yet, on account of the small size of the islands and the prevalence of the trade-winds, the heat is seldom severe. Owing to the continuous heat and great humidity, the mountainous islands are trying to Europeans; but even here there is great difference between groups similarly placed in all respects. All the islands eastward of and including Fiji, says Mr. Whitmee, are much more healthy than those to the west.

In the former, endemic fevers are rare; while in the western, missionaries do not find it advisable to remain long on the islands, from their liability to febrile affections. And not only so, but the natives of the eastern groups suffer from ague when removed to the western ones.

The Sandwich Islands, in lat. 22° N., and long. 155° W., will illustrate those north of the equator. The mean temperature at Honolulu is 76°·1, the mean of December 71°·6, and of July 78°·9 Fah. The wet season is from December till March, the rest of the season being dry. The air is hot and humid in the interior valleys, but drier on the coast. The Sandwich Islands are healthy to Europeans, at least for a number of years; yet the native population is rapidly decreasing, from drink and exposure. The diseases are phthisis, asthma, continued fevers, variola, scrofula, skin diseases, syphilis, influenza, and mild dysentery among Europeans.

The Society Islands lie south of the equator, in the 18th parallel. They are said to possess a climate tropical in latitude but temperate in character. The mean annual temperature at Tahiti is 76°·5; of the coldest month, 66°·5; and of April, the hottest, 85°. The extremes are between 95° and 57°. The relative humidity is extreme, ranging

from 79 and 70 to 89 per cent., the maximum being often 99·6. Papite, the station, is protected by hills from the wet north winds. The dry season is from May till the end of September, and the wet the rest of the year, when the rain falls in torrents and without intermission for weeks.

New Caledonia possesses a fairly healthy climate, and the upland interior is capable of white colonization. Fevers to some extent prevail. The climate of all the small southern islands is similar, but less equable than Tahiti.

Salubrity.—Europeans enjoy good health without any previous acclimatization. The mortality of the French troops at Tahiti, though sometimes engaged in warlike forays, varied between 1 and 0·50 per cent. per annum. Thus it appears that the healthiest of these islands are capable of white colonization, for the absence of active disease allows time for the system to become acclimatized. There can be no doubt, however, but that the transplanted race will vastly deteriorate from its pristine condition in Western Europe. In Polynesia, as in the Indian Archipelago, consumption is most to be dreaded. It causes in Polynesia one-fourth of the native mortality, and, like acute chest affections, is due, not only to the damp, hot climate, but to defective clothing, exposed dwellings, and abuse of cold bathing. Venereal disease is next in importance; elephantiasis and leprosy are common; and here, as in China, the latter is sometimes either latent or indistinct in the female, and may be dangerous to those who approach her; influenza and measles are common; cholera has not yet appeared. The Solomon and New Hebrides groups are said to be hotter and more malarious than the western groups.

AUSTRALASIA.

Australasia includes Australia, Tasmania, and New Zealand, with their health resorts.

Australia lies between 10° and 39° south, with a length from east to west of 2,400 miles, and a breadth from north to south of 2,000 miles.

Australia has an even coast line, with the exception of the northern and southern gulfs. From the existence of an immense level tract between those two approaches of the sea, it is supposed that formerly the country was divided into two or more separate islands. The principal mountain ranges border the coasts at a distance of from 50 to 140 miles inland; generally these mountains are not of great elevation, though they vary from a few hundred feet to seven thousand feet. Owing to their proximity to the shores, Australia contains fewer large rivers than any portion of land of nearly equal extent in the globe, a circumstance which also explains the droughty and barren nature of the immense level plains of the interior. Between the circular mountain chain and the sea the country is mostly colonized. On the southern and eastern shores some of the finest scenery is found, with an abundant supply of pasture, wood, and water. Within the mountain ranges, and separated from each other by low ridges, are vast, rolling, dreary, arid, and almost rainless regions.

Owing to the immense extent and uniform character of the dry interior, shut off on every side except the south from the moist winds of the ocean, the climate variations are less than in any other country of equal extent on the globe. Played on towards the north of this level basin by a tropical sun, the heated air expands, and as its place is left unoccupied by the cool air of the ocean, the heat becomes intense, often rising to 100° in the shade, not only in the north but also in the south. Only once in every few years do the clouds surmount the hills, and renew the life and vegetation of these thirsty lands. The hot winds which blow from the north are followed by gales from the south, when the wind veers rapidly round, and blows furiously for hours, raising mountains of dust and carrying with it everything that ventures to oppose its progress; the temperature at the same time rapidly falls, the change being enormous.

The south-eastern part of Australia, the Australia Felix of Maitland, is the most favoured part of the country. Here

the Murray, with the Darling and the Murrumbidgee (beautiful river), flows for some 2,500 miles through rich pastures, beautiful downs, and parklike woodlands. Here also are the prosperous and vigorous states of New South Wales and Victoria, inhabited by a patriotic and intellectual people, intensely proud, as well they may be, of this fair land of their birth or adoption.

New South Wales.

New South Wales extends along the east, from 28° to 38° S. lat. Along the coast the air is moist and mild. The mean annual temperature is 62°·5, and it varies from 79° in January to 59° in July, the extremes being between zero in winter and 85° in summer. The rainfall is between 40 inches and 50 inches. On the interior table-land the mean is 50° or 60°, falling well below the freezing-point in winter, and rising to 105° in summer; the rainfall is 20 or 30 inches. On the western slopes of the hills the rainfall is 18 inches, and on the western plains 8 inches, and the heat ranges from 8° below zero to 110° or 120°. In New South Wales, autumn is cloudy; January and February are the hottest, and July the coldest months. The winter at Sydney is genial, and the mean temperature is 62°.

Victoria.

Victoria lies south of New South Wales, and the mean annual temperature of the whole colony is 56°·8, that of Melbourne being 57°·6, the lowest at Melbourne being 27°, and the highest, when the brick-fielders blow for a few hours, 111° in the shade. At Sandhurst, 778 feet above the sea, the greatest heat is 117°, and at Ballarat, at an elevation of 1,200 feet, the greatest cold is 10° below the freezing-point; Daylesford has an elevation of 2,000 feet, and is in winter somewhat colder still. The rainfall for the province is 42 inches, and for Melbourne 28 inches, and the relative humidity is not great, being as low as 60° during the hot winds. In Victoria the spring is genial and pleasant, with

some rain ; the summer is hot and dry, with a few showers in December. In February the hot winds set in, to be followed by pleasant autumn weather in March, with fresh vegetation as in spring. The winter is apt to be windy, with frequent rains ; sun or ice is seldom seen.

The town of Geelong has a fine climate, and extensive docks.

The Riverina, between the Murray and Murrumbidgee rivers, has an elevation of 1,200 feet, and is well suited to consumptives. In this district are Goulbourn and Echuca on the Murray, one of the best known health stations in Victoria.

Queensland.

Queensland extends from lat. 10° S. to lat. 28° S. This colony, though tropical in latitude, possesses the characteristics of a warm and genial climate, owing to its extensive coast-line, its peninsular shape, its abundant rainfall, and the greater absence than further south of scorching hot winds. The rainfall varies from 160 inches in the north to 40 inches in the south, on the coast from 30 inches to 70 inches in the east highlands, and from 15 inches to 30 inches in the highlands of the west. The mean temperature at Brisbane is 69°, and the extremes are between 34° and 105° Fah. In the hilly districts, even within the tropics, there is frost at night.

Queensland, though almost entirely occupied by Europeans, is very healthy, but in the tropical portion, among the sugar-canes, white men cannot work in the fields. The mortality at Brisbane is 13 per 1,000, Toowoomba 17, and Rockhampton 15. In the tropics it is 12 at Chartoris Town, and 29 at Mackay, where, however, Polynesians are numerous. Endemic fevers often attack those engaged in the work of colonization, and the female mortality is therefore less than the male.

Cooktown, lat. 16°, is looked upon as a sanitorium.

South Australia.

South Australia includes the barren central basin, of which we have spoken. The following table from Dr. Astles will give a fair idea of the temperature of the southern parts of South Australia :

TEMPERATURE AT THE ADELAIDE OBSERVATORY IN 1886.

MONTH.	MAX. SHADE.	MIN. SHADE.	MAX. SUN.	LOWEST MAX. SUN.
January	112·4°	50·8°	174°	91·4°
February	105·7	49·1	161	114
March	99·3	48	152·7	128·8
April	94·4	44·6	149·9	66·5
May	73·5	37·7	131·1	105·4
June	68·3	36·6	124·5	69·2
July	69	36·6	121·5	66
August	73·1	38·6	128·1	63
September	82·5	40·1	141·2	71·8
October	79·3	39·5	135·8	98·4
November	99·1	46·5	156	110·8
December	102	46·9	155·1	126·1

C. TODD,
Government Astronomer.
1887.

The coasts of South Australia have a cool sea-breeze, a scanty rainfall, and a warm, dry climate, and are therefore better adapted for consumptives than the coasts of the other colonies. The dry interior is also well suited to consumptives in the proper season, but during the dry, dusty, and scorching hot winds, which blow for days at a stretch, and the succeeding cold ones, which rapidly lower the temperature, and between them give rise to heat, oppression, and chills, the climate is trying to the strongest, and utterly insupportable and dangerous to invalids, and especially so where there is a tendency to hemorrhage.

Invalids, therefore, arriving in the hot season should follow Dr. Astles' advice, and remain at Kangaroo Island, Port

Lincoln, Port Victor, Port Elliot, or Edinburgh, as at such places only are the nights cool and the use of blankets possible. The Mount Lofty ranges, at an elevation of 2,000 feet, are also good. Those who cannot stand the irritation of the land winds will do very well to remain permanently on the coast. Invalids should arrive in September.

It is advisable that all should have either money, or friends to receive them on landing, for employment is difficult to get. Neither among the rich nor the needy should advanced cases of consumption be sent to Australia to perish. There are good hotels in the large towns to suit the wealthy and those to whom good cooking is a matter of vital importance. The large towns should, however, be as far as possible avoided. Patients on arrival should invariably consult a respectable physician as to the town or district more especially suited to his prospects, means, and conditions.

West Australia.

This division occupies the whole western and part of the north and south coasts.

The coast climate, especially towards the S.W., is delightful and invigorating. The mean winter temperature at Freemantle, lat. 32°, is 60°, and of the rest of the year 75°, and there are no extremes to speak of. In the S.W. alone is there enough rain for cultivation. The rainfall at Perth is 30 inches, falling on 100 days, and the mean temperature is 60°, varying from 104° to 34°. Albany has 32 inches, and 138 wet days; Augusta, 46 inches; York, 18 inches; and Cossack, in the north, has 10 inches falling on 18 days. In the Swan River district the summers are dry and the winters wet.

West Australia is very healthy; endemic fevers are unknown, and consumption and chest affections are very rare. Those who live an active outdoor life are always well. The colonists, even the little children, eat largely of animal food, not only, according to Gilbart, without injury, but with advantage.

Men attain a great age, children are very free from disease, and women long sterile often recover their reproductive powers. Consumptives also do well. The soil is sandy, and the population is exceedingly scanty.

Salubrity of Australia.—Australia is a healthy country, malarial diseases being mild and infrequent. The exanthemata are rare. Phthisis in certain parts is also rare, though it is remarkable that the mortality of the British troops from this disease was 5·3 per 1,000—the highest rate in the army wherever stationed. Bronchitis, ophthalmia, febricula, laryngitis, and chronic rheumatism are rather frequent. Hepatitis and hepatic abscesses are rare, and yet the people indulge in large quantities of animal food, and are not more temperate than other Europeans in warm countries. Hydatid, or fluke disease of the liver, is very frequent. Piles occur from riding in wet saddles. The diseases of childhood are more frequent than in Europe, and are answerable for 15 per cent. of the general mortality.

Tasmania.

Tasmania is a beautiful mountain island lying immediately S.E. of Australia. The centre is well wooded, and has hills rising from 2,500 to 5,000 feet; the east side is pretty well occupied, but the west is wooded and wild. The chief towns are Hobart, Launceston, and Port Arthur. The climate of the east side is dry, and of the west damp, while the north-east is so dry that it often suffers from drought, and in summer the hot winds of Australia are felt. The rainfall on the west coast is 100 inches. The mean temperature at Hobart Town is 54°, of July 44°, and of January 62°. The north-west is mild, wet, and equable, and the mean temperature at Waratah is 44°. The inland winters are sharp but short, and in the highland lake district the climate is foggy, misty, and changeable.

The winds blow strongly on the west and south coasts. Tasmania is a healthy island, and Hobart and the other eastern parts are well suited to consumption.

It is well suited to English colonization, and to some extent is looked upon as a health resort by the Australians.

New Zealand.

This fine colony is composed of the north and south islands, with the small Stewart's Island in the extreme south. It lies between 34° and 48° S. lat., and 166° and 179° E. long. This group is about 1,100 miles long and 120 miles broad. New Zealand is a very mountainous country. In the north island the elevation of the mountains varies from 1,500 feet in the north to 6,000 feet in the centre, the highest peak (Ruapehu) being 9,165 feet. Plains lie at either side, but principally towards the west. About one-tenth of the north island, and four-fifths of the south island are hilly. The greater part of the latter is an open wooded, elevated plateau. The main range runs close to the west coast, and the highest peak is 13,000 feet. There are also many lakes and geysers, and the whole country is one of surpassing beauty and picturesqueness.

The climate has been said to resemble England, and this is true, in so far that there is no other colony or new country beyond the seas whose climate is at once so healthy and equable to the inhabitants of these islands. Although the temperature and moisture vary considerably, it is seldom that the summers are warmer than in England; while the winters are never unpleasant, cold, or disagreeable. The climate is generally moist, warm, and variable, with a good deal of wind and considerable variation between the night and day temperature.

The mean annual temperature of the north island is 57°, and of the south island 52°; and the mean for the whole colony is, spring 55°, summer 63°, autumn 57°, and winter 48°. The nights are always cool. The annual extremes are greater on the east coast than on the west; and the north-west, on which the equatorial current impinges, is the most equable of all. Christchurch has a greater range by 18° than Hokitika; snow scarcely ever falls, and frost is

off the ground by nine o'clock. In the north island the heaviest rainfall is in winter, but in the south it is equally divided; and it is much heavier on the west than on the east coast in both islands, but especially in the south one. Drought is very rare. Westerly winds prevail, but cold south winds often lower the winter temperature. Strong breezes are frequent along the coasts, and the air generally throughout the country is in active movement.

The climate of the chief towns is as follows:

	ANNUAL MEAN TEMP.	MEAN DAILY RANGE.	RELATIVE HUMIDITY.	DAYS' RAIN.	INCHES RAINFALL.
Auckland (North) ...	59°	13°	76°	191	44
Wellington (South)...	55	11	72	151	51
Dunedin (South) ...	50	13	76	182	34

Salubrity.—New Zealand is a healthy country, and well suited to English colonization.

Bronchitis, rheumatism, diarrhœa, mild dysentery, and ophthalmia, are the most common complaints.

The military mortality from phthisis during the war in 1866 was only 0·36 per 1,000; while that of Australia in time of peace was 5·3. This freedom in New Zealand was probably due more to the active outdoor life of the men than to climate. Phthisis is now common enough among the people; and Dr. Bakewell, of Auckland, believes that New Zealand is not well suited to consumptives. If invalids are sent here, they should have sufficient pecuniary resources to enable them to hire a cottage, with servants and nurse if required.

'No hotel or boarding-house in the Australian colonies, except at a few professed health resorts, has suitable accommodation for a confirmed invalid. Weak-chested tradesmen, or others not able to do a full day's work, have no chance; for,' says Dr. Bakewell, 'if we have one carpenter out of work, we have 100.' My own opinion and experience

is that some parts of New Zealand are very useful to carefully-selected poitrinaires, who can choose their residence and live in comfort. Auckland is too hot and relaxing, and Dunedin too variable and cold; but Nelson, Napier and Tamanga, and many places in their vicinity, possess a climate that is beneficial, not only to consumptives, but to all whose condition of lungs renders them unable to stand the severity of an English winter. Christchurch I have also known to prevent the development of hereditary consumption.

Nelson is in the north of the south island, and is well sheltered from the high prevailing winds. The average winter temperature is 40°, summer 60°, and the minimum in winter at night 30°. The rainfall is 45 inches. Not only at Nelson, but generally all over the country, the winters are short and mild, and the summers long and cool. The air, all the year round, is genial, and with cool, crisp nights and a clear sky; and the sun is so continually in evidence, that an invalid is rarely debarred from outdoor exercise. He can, in fact, generally bask in the sun even in winter. The nights, however, it should be remembered, are apt to be cold; and there is a good deal of difference between the day and night temperature.

Mineral Springs of Rotorua.

The sanatorium geysers and baths of Rotorua cover an area of fifty acres. As the springs are of every description, and the accommodation, arrangements and medical skill are well up to date, no Australians, or others who are likely to be cured by balneological treatment, need remain unrelieved. Rotorua is fifty miles from the coast, and 900 feet above the sea, and is reached either directly by rail and coach from Auckland, or more slowly by Wellington.

The summer climate is fairly bracing. Warm clothing and strong boots are requisite; and jewellery is apt to get spoiled by the sulphur vapours. Dr. Ginders is the physician.

CHAPTER XIII.

Sea-sickness, Sea Voyages and Sea Bathing.

Sea-sickness.

Sea-sickness is a functional disease of the nervous system, produced by a series of shocks caused by the motion of the ship. It is predisposed to by rich food, beer and tobacco, while a light repast before embarking is beneficial. The symptoms are giddiness, headache, nausea, intolerance of food, increased gastric secretion, retching, vomiting, and a feeling of utter wretchedness and prostration. There may be diarrhœa or constipation, and lessened secretion of urine. On landing after short trips, and in a day or two, if the weather is favourable on long voyages, most people recover. In bad cases, however, there may be bilious vomiting and cramps in the stomach and limbs, with cold extremities, and a sleepy, listless, and worn-out state of the body. The most common complication is hysteria, but gastritis, swooning, and abortion occasionally occur. The very young and the very old are good sailors.

On, or before, embarking some light food should be taken, and the heat of the body maintained. Passengers should remain on deck, if it is possible, or otherwise endeavour to get as much fresh air as the situation will admit of.

The following draught will be useful in the early stage :

Bismuth trisnitrate . .	iv. grains.
Spirit of sal-volatile . .	xv. minims.
Spirit of chloroform . .	xx. minims.
Bicarbonate of soda . .	xv. grains.
Dilute hydrocyanic acid . .	ii. minims.
Tincture of ginger . .	x. minims.
Tincture of gentian . .	xv. minims.
Water	$1\frac{1}{2}$ ounces.

Mix and make a draught, to be taken effervescing with a little lemon-juice every two or three hours.

Twenty grains of hydrate of chloral, or a full dose of laudanum or morphia, will often do good Nitrate of amyl, cocaine, and in short voyages ice to the spine, are sometimes useful. The nourishment should at first be limited to a little ice or iced champagne and a biscuit, followed up after sometime by chicken-broth, or beef-tea, and a little brandy. An occasional dose of blue or rhubarb pills, followed in the morning by Eno's Fruit Salt, will also be necessary.

Sea Voyages.

Of late years the beneficial practice of recommending sea voyages has become popular in England—a practice which has for a long time been recognised as exceedingly useful in tropical climes. When suitable food, rest, comfort, and ventilation can be provided on board ship, and the weather and state of the patient allows of sitting daily on deck, I am a strong advocate for cruises in tropical seas. Almost any curable disease, including early and irritative phthisis, will probably be benefited. Care must be taken to shut the ports at night on approaching land, and invalids should never indulge in the habit of sleeping on deck, a habit which, in suitable weather, and when covered with an awning and blanket, is most advantageous to the healthy. Hepatitis, subacute and chronic dysentery and diarrhœa, and conditions associated with debility and exhaustion, will derive much advantage. Acute dysentery I have seen rapidly improve, not only on the high seas, but on river cruises as well. After personally suffering from intolerable dysentery, attended with nausea and extreme depression, for fourteen days, without relief from ipecac. and other medication, I embarked on board a river steamer at Mandalay, when I mended so quickly that after three days I was able to take solid food, the air and change alone having effected a cure. Flannel belts should be worn, and the delicate had better remain below till after the decks are

washed and properly dried. Here I may remark that the majority of the flannel belts sold in the shops might be greatly improved on. They are far too short. A good flannel belt should extend from the upper margin of the liver to the pubes. In recommending sea voyages to patients in England, it should be borne in mind that during the voyage the climate is continually changing, and that there is, particularly in warm seas, great danger of night chill on approaching the shore. The voyage to do good should be of considerable duration, and undertaken in such latitudes and seasons as will admit of sitting comfortably on deck. There should, in fact, be the prospect of a good supply of sunshine with the minimum of stormy and bad weather. On account of the want of these requisites, and because the trip is too short, the North Atlantic should be avoided by all but the strongest. Here bad weather is liable to prevail, unless for a few months in the summer, rendering exercise impossible ; and stormy weather, entailing confinement and general discomfort, may continue for days, and even weeks, without intermission. Under such conditions, aided by over-eating and drinking, dyspepsia, numbness, confusion of thought, and loss of the memory of words I have known to occur. These I have always found to be only of short or temporary duration. Sea-sickness also is apt to be very distressing; but during my experience as ship's surgeon I have only seen one death that could in any way be attributed to this disease.

Dr. Symes Thompson, in the *Medical Press and Circular* of November, 1888, speaks highly of the voyage to the Cape and back, which can be accomplished in two months during the summer holiday, without any discomfort, storms, or excessive heat in the tropics. He recommends this voyage for patients suffering from chest affections, for whom a soothing, moist, warm air was needed, and who required rest and quiescence as contrasted with the class suitable for Alpine winter treatment, in whom the great point is to encourage exercise in dry and very exhilarating air. The

voyage to India or Australia is also often productive of good, and may be undertaken by those who have plenty of time and money to spend. The Indian poitrinaire visitor should arrive about the 1st of November, when the cold weather commences, and he will then find an agreeable climate, and such places as Bangalore, Secunderabad, or other large stations on the Deccan, where, with care as to clothing, the avoidance of night chills and cold baths, he is very unlikely to suffer from fever or other tropical disease. About February he should try one of the driest of the numerous hill stations, and make the return passage so as to arrive home not earlier than the middle of May. Besides the phthisical, sufferers from chronic bronchitis, chronic pleurisy, and pneumonia, syphilitic cachexia, fistula, rheumatism, and albuminuria, and the convalescents from surgical operations will derive advantage. Healthy and mentally overworked people also, and those who object to the winter in England, and are fond of travel, will find this an agreeable and restorative outing. The climate of the North-west Provinces and the Punjaub is agreeable in the cold season. This is, however, the most feverish part of India, and will probably remain so till the rich alluvial soil is thoroughly drained and brought under cultivation. Cholera, also, is always present in the Gangetic provinces, and occurs only at intervals in Southern India.

The voyage to Australia will also prove beneficial, and consumptives who intend to remain, should endeavour to arrive in this country in September or the early part of October, or if they cannot do this had better remain at such sea-coast places as Kangaroo Island and Port Lincoln—waiting till after the hot season (December, January, and February) to proceed to the dry inland country, so well suited at other times for the relief and cure of the early stages of phthisis. I mention this because I once had a patient who, on proceeding inland in the hot weather, rapidly succumbed to hæmoptysis, which rather surprised me, for, although the disease was hereditary, there were no local or

general symptoms to speak of. The Azores, the West Indies, the Mediterranean are suitable for spring, autumn, or winter trips, but as regards South America and Africa our winter is their summer, which season is generally too hot for consumptives to make their first acquaintance with the country.

Bencke states that sea air cools the body relatively quicker than mountain air, and is therefore more efficient in the production of tissue change. However this may be, a long voyage in fine weather on a well-appointed ship is likely to benefit chlorosis, scrofula, amenorrhœa, indolent surgical affections, irritable throat affections, delicate children, and in some cases sterility in women, and impotence in man. I have heard rumours of captains' wives being cured of cancer during long voyages, but never knew of an authenticated case. From two years' experience as a ship's surgeon carrying large numbers of passengers, I think I may state that hysteria and menstrual disturbances are apt to occur in the predisposed. The organs of generation are also invigorated, and the whole system braced up and improved.

Pregnant women are bad sailors, particularly at the commencement and towards the end of gestation. Dyspeptic and bilious people, unless they can take a good deal of exercise, are apt to feel seedy at sea, and to suffer from sickness. Some, however, do well after a few days.

Cases of dilated heart, greatly enlarged liver, hæmoptysis, epilepsy, and advanced cases of consumption are not adapted for life on board ship. I once watched a case where large cavities existed; on the passage to India I must say there was considerable general improvement, but none as regards the local disease, the expectoration increasing. Children, as a rule, are good sailors, and do well at sea, unless predisposed to convulsions or brain inflammation. Voyages are also useful in early locomotor ataxy, sleeplessness, and general over-fatigue, and weariness.

Choose a ship high out of the water, as on the P. and O.

line ; for in a ship low in the water the ports must be shut if the weather is fresh. Select a berth on the cooler side of the ship, which can be found on inquiry—it is the port side on the passage to India—and let it be lighted from the port-hole at the side, and not from the deck, and not to be too close to engine or stern. It is a good plan also in hot weather, when one is apt to kick about at night, to fold a blanket and roll it round the abdomen and chest, and to wear loose sleeping trousers and jacket. The jacket and drawers should be worn in all climates. Being once in a collision when sleeping without such equipment, I was so long getting on deck, that I was not entirely free from anxiety, though our vessel suffered no damage to speak of.

Sea Bathing.

Bathing in the open sea differs materially from tepid, or even cold, saline baths taken under cover, and to some extent also from bathing in enclosed swimming baths, into which sea water has been artificially introduced. The difference mainly depends on the series of shocks produced by the waves, the influence of the open air, the varying temperature of the water, the strength of the waves, and the character of the winds, all of which are subject to daily change. The temperature of the water, in addition, often changes greatly during the same bath as we pass from a warm to a cold stretch of water. Thus it is evident that a fair amount of physical strength and power of re-action is necessary to the safe utilisation and enjoyment of sea bathing.

Delicate, nervous women with a weak circulation, who are not otherwise subject to disease, and very young children, are unfit subjects for bathing. Such people will, however, derive great advantage from the use of tepid sea sea baths.

The water of different seas varies considerably in temperature and strength, and that place and season are most suitable for bathing in which the temperature of air

approximates nearest to that of the sea. The Mediterranean contains from $3\frac{1}{2}$ to $3\frac{3}{4}$ per cent. of salts, and its summer temperature varies from 72° to 80°. The Atlantic contains from 3 to $3\frac{1}{2}$ per cent., and its temperature about 73°, while the Baltic, with only $1\frac{1}{2}$ per cent. of salts, is only suitable for bathing in August. Of other seas, the temperature of the North Sea is from 60° to 68°, that of the Channel 68°, and of the Bay of Biscay 73°. In early summer the temperature of the water is relatively colder than the air, while in September it is generally warmer; consequently, although the air in June is often remarkably hot, the bathing season in the British Islands, Holland, Belgium and the North of France is during the months of July, August and September, as most people prefer the sea as warm as it can be obtained. The Atlantic and Channel coasts will generally be preferred to the North Sea, especially the Scottish portion.

In order to thoroughly enjoy a bath in the sea a knowledge of swimming, however slight it may be, is absolutely necessary. Yet, as the sea is badly adapted for those learning to swim, all young people should endeavour to acquire the art in swimming baths, which are now available almost everywhere.

On entering, the head should at once be dipped under the water, and this act repeated during the bath. Ladies, however, often object to the practice, as it is troublesome, causes the hair to fall out, and is sometimes productive of deafness and tonsillar congestion. The hair, however, is sure to grow stronger, and deafness may be prevented by keeping the mouth shut and a little cotton wool in the ears. When the head is not wetted a canvas cap should be worn. When a rupture exists it is no doubt safer to wear one's truss in the water, nevertheless I must say a neglect of this rule I have never known attended with danger.

Little people should never be forced, but coaxed into the water, when even the most timid will soon get to enjoy it. Most people prefer to bathe when the tide is well up in the

forenoon, but for the strong and energetic the morning is preferable. Bathing should never take place when the stomach is full, a couple of hours being always allowed for digestion. A neglect of this rule is exceedingly apt to be dangerous. At Boulogne, and other places, hot foot-baths are provided, and they are useful in hastening re-action. Old people should not dive, but walk into the sea. On blustery days the waves are apt to cause a tinting of the skin, and when there is hæmorrhagic stasis, the body becomes as red as a lobster. Generally, it is better not to bathe on cold, wet, or blustery days. Once a day is sufficient, and the duration of the bath, at all events for non-swimmers, should not exceed fifteen minutes, and for children and those with deficient re-action two to five minutes will be most beneficial. Twenty-one baths is the regular course.

Sea bathing is for most people a powerful restorative, and the benefit conferred will last during the ensuing winter. It is, *par excellence*, the great remedy for scrofulous, glandular, and articular enlargements. It is accordingly useful in bracing up delicate children and defending the system against subsequent cold-catching. Vaginal and uterine congestions and relaxing discharges are generally benefited, as are also spinal weakness and incontinence of urine in the young. I have known a certain amount of irritability of the heart, the result of tobacco, completely cured by sea bathing, followed by super-cardiac rubbings.

It is useful in torpid conditions of the skin attended with profuse perspiration, also in muscular rheumatism, though in articular rheumatism hot baths only should be used. That form of rheumatic taint accompanied by choreic twitches and hysteria is often benefited by mild bathing, and it has been recommended in hysterial, diphtheritic, and typhoid paralysis; and nervous dyspepsia, amenorrhœa, anæmia, and chlorosis are sometimes benefited. Such diseases should first be treated by tepid sea baths.

A broad sandy beach should always be selected for

children, who love to revel on the sand and wade in the water. This practice of wading is sometimes followed by chills and sore throat, and should not, therefore, be followed by very young children, nor continued longer than half-an-hour at a time, and the clothes should be always carefully tied up and otherwise protected from wet. Slight attacks of sunstroke are common at the seaside; they may generally be cured by a tepid bath, cold to the head, a couple of days' quiet, and a few drops of aconite.

Generally speaking, then, under the good influence of sea baths there are abstraction of heat, stimulation of the peripheral nerves, and increased tissue change, attended or followed by increased appetite and bodily weight. Their bad effects are manifested by deficient re-action, vomiting nausea, headache, impairment of appetite, and loss of weight. These results, however, are often due to the too frequent or too prolonged immersion, and are consequently easily remedied. Headache is often preventible by putting the hat on at once on emerging.

The following should not bathe in the sea: Those subject or predisposed to fits, as the epileptic or apoplectic; sufferers from cutaneous eruptions, organic disease of the heart or great vessels, organic disease of the liver, lungs, or abdominal organs, the tubercular, the rheumatic, the very old, and persons subject to cramp. I have seen a periostal ulcer, the result of injury, remain incurable at the seaside, which healed up in a fortnight on return to London.

CHAPTER XIV.

CENTRAL AFRICA.

The Climate of Africa as it affects Europeans; embodying the Views of Surgeon Parke, D.C.L., F.R.C.S.I., late of the Emin Pasha Relief Expedition, under Stanley. South Central Africa; management of fevers.

Having asked Dr. Parke to write a chapter on the climate and diseases of Africa for the new edition of this work, he kindly expressed his willingness to do so. Being, however, pressed for time, he thought it would answer the same purpose if I called on him, when he would verbally give me the result of his experience. Accordingly, I proceeded to Hyde Park Barracks, and at once commenced to commit to paper the information which Dr. Parke communicated almost literally as follows :

For some years previous to joining the Emin Pasha Relief Expedition I was stationed in Egypt, and am acquainted with all parts of the country, from Alexandria, on the Mediterranean seaboard, to Metemmah, in the neighbourhood of Khartoum. Metemmah is the station on the Nile where we received the news of the fall of Khartoum and the massacre of General Gordon, its gallant defender. The expedition for his relief, therefore, proceeded no further. Egypt is a country with a great and prosperous future before it, and is full of interest to the merchant, historian, the antiquarian, and the invalid. The climate varies greatly. Alexandria is hot and damp, with cool nights. Cairo is dry and hot, while at Assouan, where is situated the first cataract, at Metemmah, already described, and at Dongola, the heat is very great, the highest in the shade being 119° Fahr. Of all places in Egypt, and indeed in

Africa, nowhere did I find the weather so damp and oppressive as at Alexandria. This is obviously no place for the consumptive, asthmatic, or rheumatic to linger; he should push on at once to Cairo, where he will find a warm, dry climate, good hotels, and pleasant society. To such invalids as are able to enjoy the pleasures of society, Egypt will prove a happy hunting-ground. The people of all nationalities are exceedingly hospitable, and though society is to a great extent cosmopolitan, the Englishman will find himself largely among his own countrymen, who are now the ruling element on the banks of the Nile.

As Cairo is a large city, and in parts dirty and overcrowded (though great sanitary improvements have taken place since the British occupation), those who wish for quiet can drive out along a well-kept, shady road, to the Meena Hotel, at the base of the Pyramids. Here the air is pure, fresh, dry, warm, and invigorating, with clear skies, and deliciously cool and limpid evenings, and here also will the invalid increase in health all the quicker for the knowledge that forty centuries of civilization look down upon, and are interested in, his recovery.

A voyage in a dahabya, a Nile boat, is most restorative and invigorating, and the cost, with a steamer to tow it from Cairo to Assouan, is about £20. A steamer is not, of course, absolutely necessary, but it greatly conduces to comfort and convenience. During these trips the evenings are generally damp, and all invalids should go below at nightfall. Egypt, however, is no place for the man of scanty means, and the *pension* at the hotels for three meals in the Continental fashion varies from ten to twenty francs a day: wine, such as Chianti, is generally included. Though there are a few villas and flats, they are by no means cheap or easy to procure. Invalids should leave the country in March.

Though the military mortality was high during and immediately after the war, Egypt is not now, at any rate, an unhealthy country. The principal disease is a species of

gangrenous ulcer, known as the Nile boil. This ulcer begins as a boil, and is most frequent in the remote parts of the country, and is due to the constant use of the Nile water. Though it principally attacks whites, the natives are also liable. The best treatment is good food and caustics. Intermittent fevers are rare, and typhoid, formerly so fatal, is not at present of more frequent occurrence than in most other countries. There is some dysentery and diarrhœa, and a good deal of illness from drinking. On the whole, however, Egypt must be considered a healthy country. It is, however, especially in summer, a very hot one, the greatest care being necessary to protect the head from the rays of a powerful sun, which is constantly in evidence, the rainfall and cloud shading being almost nil. There are well-qualified medical men at all the principal towns, with English qualifications.

Zanzibar.

From Egypt I proceeded with the Emin Pasha Relief Expedition to Zanzibar to pick up our bearers and soldiers. Zanzibar is a large city situated on the island of the same name, and is the principal *entrepôt* and emporium for the traffic on the East Coast of Africa. It lies low, has a sandy soil, and though most beautiful and verdant to look upon, is exceedingly feverish and unhealthy—the climate being hot, damp, and equable, and with but little difference in temperature between the hot and cold seasons. The fevers are both intermittent and remittent; they are frequently fatal, and as vomiting is a predominant feature, the administration of quinine by the mouth is often impracticable. Under such conditions the hypodermic tabloids of Messrs. Burroughs and Welcome were of the greatest utility. So unhealthy is this station, owing to a certain extent to remediable causes, as filth, bad drainage, and the malodorous state of the Malagash inlet, that it is not unusual for one half of the white community to be on the sick list at once.

Leaving Zanzibar, we proceeded round the Cape of Good Hope and thence north along the West Coast of Africa to Banana Point, at the mouth of the Congo. At its embouchure the Congo is a magnificent river of immense breadth, and of such velocity that it renders the waters of the ocean fresh for 300 miles out at sea. The country on either side is sand, low-lying, very feverish, hot, and unhealthy. From Banana Point we sailed up the river by Boma to Mattady, a distance of 300 miles, where we disembarked. On approaching this station the country becomes more diversified, with hills on either side of the river. Disembarking at Mattady, where the plateau commences, and owing to cataracts impeding navigation, we marched for 300 miles to Stanley Pool. Between Mattady and Stanley Pool, which is an enlargement of the river in lat. 4·8°, the Government of the Congo State are now making a railway, which will not only bridge over the region of the first system of cataracts, but become also instrumental in opening the country through which it passes. This region is from 1,500 to 2,000 feet above the level of the sea, and though bare and devoid of many forest trees, is generally cultivated and inhabited, though not thickly. Through this district, which is very unhealthy, we marched mostly in the morning, the daily journey varying between three and twenty-five miles, according to the nature of the country and the loads to be carried. The prevailing diseases were fevers and dysentery, or rather a gastro-intestinal catarrh, both the results of cold nights following hot days, exposure to sun, and chills from winds, wettings, wading through rivers, and fatigue.

It is necessary, in marching through these regions, to keep the feet well covered, and as mosquitoes and ants will render the use of stockings and boots a necessity, and it should also be borne in mind, particularly when the blood becomes impoverished by long residences in the country, or on remote expeditions, owing to unsuitable food, that the slightest abrasion is followed by ulceration. Itch is also a common disease, and under the conditions just noticed is

often followed by ulcers. We re-embarked at Stanley Pool and continued by the river, through a rather unhealthy district, with occasional forests and low hills on either side, to Yambuya.

Disembarking, we journeyed by land to Stanley Falls.

I may here remark that in Africa there are no beasts of burden, everything being carried by man, 100 lb. being the usual load, which is borne on the head, and that I myself marched right across Africa on foot. Through this district native villages are numerous, and the land is fairly well cultivated, and there are also several mission stations. Everything is, however, in very primitive condition, and the food is the produce of the country, obtained by barter with the natives. All the district has an elevation of under 2,000 feet, and though not capable of the first degree of colonization as laid down by Dr. Cullimore, viz., That which enables white men to work in the fields and on the farms, and to bring up their families and settle in the country as at home, is still capable of healthy occupation by the utilization of the natives to do the work in the fields. It is, however, it should be borne in mind, advisable that white men should return to Europe every two or three years.

From Stanley Falls the route lay for 160 days through a dense forest, and one so impenetrable that our road had to be cleared as we advanced, while the smell from the decaying vegetable matter, that to the depth of a foot carpeted the ground, was at times overpowering. During this part of the journey the expedition was for 120 days without meat, our food supply mainly consisting of Indian corn, bananas, tops of bushes, wild spinach, and young leaves. As a result, dysentery, anæmia, ulcers, and fevers were of frequent occurrence. Of such frequency were these fevers that every member of the expedition suffered from fever at least 200 times. They were often very severe, with a daily rise to 106° Fah. of the temperature of the body. Besides the ordinary intermittent and remittents which occurred all

across Africa, we encountered a very severe form on the Congo, from which I suffered myself. This was a hæmorrhagic variety, attended with high temperature, congestion of the liver and spleen, an icteric tint of the conjunctiva and skin, and the passage of blood in the urine; it was also attended at times with unconsciousness and violent delirium. This fever, of whose cause I am unable to speak with decision, though exceedingly fatal, was not by any means of frequent occurrence. The best treatment was mercury, quinine, and milk diet.

During our route through the forest we encountered two types of inhabitants: first, a people of ordinary size; and second, a small type called pigmies, who are the veritable acclimatized children of the forest, for they speedily die on removal from the protecting influence of its shade. It is worthy of note that neither the pigmies nor other inhabitants of Central Africa whom I have met are black, as is generally supposed, but a deep brown or bronze colour.

Mount Pisga.

At last, on the 170th day of our weary tramp through the gloomy recesses of the forest, and to the indescribable delight of the natives and Europeans alike, we emerged into an open plain at Mount Pisga. Here, though at an elevation of three to four or five thousand feet above the level of the sea, the heat of the sun was intense; but the nights were pleasant and cool, the mornings invigorating, and the evenings delicious and enjoyable. No Europeans had penetrated into the region before; the natives were remarkably hostile. This country cannot be opened up for years, at all events till after the advent of railways; but when this event happens, there can be no doubt but that it is capable of European colonization, as native labour is easily obtainable. Leaving this district of the Albert Nyanza, and the Mountains of the Moon, whose snowy summits and cool declivities will in future times afford many cool and healthy

retreats for the European residents of these regions, we descended southward to the district round Lake Muta Nzige. This country is a much lower level than that jus referred to. It may be described as a land of fogs and hills, of high and strong winds, and much fever, which is generally due to draughts of cold air.

The climate of the coast district is the most unhealthy of all, nevertheless that of Bagamoyo, Mombossa, Melinda, and other coast towns is superior to Zanzibar. Fevers are mainly the result of fatigue, chill, wet, and exposure to sun, even a strong blast of sun is often followed by fever, and they are as frequent and severe in the dry, open country as in the midst of the forest. Of malaria I have seen nothing, I know not what it is. These fevers will often last for six weeks at a stretch, with a temperature rising to 106°, and with considerable sickness and general prostration. I have not seen any of the sequelæ of fevers, such as splenic and hepatic enlargements.

European women and children do well even on the Congo for a couple of seasons. Besides the diseases mentioned, syphilis is unusually distributed all over Africa, and that though, contrary to what is generally supposed, the relations of the sexes are no looser than in most other countries.

From the lake regions, having accomplished the object of the expedition—the relief of Emin Pasha—we continued our journey to the East Coast and returned to Zanzibar, having in the long course of our several journeyings and many hardships lost but one out of thirteen European members of the expedition. Central Africa, no doubt, has a future before it, but railways are absolutely necessary to its active development. The climate, though tropical, unless as regards fevers, is not generally unhealthy, but for the maintenance of one's health it is essential to take exercise, avoid chills, and beware of the sun.

So far Dr. Parke, whose information it may be well to

supplement by the account of Mr. Stanley and other travellers.

The elevation of the Stanley Falls, which is a system of cataracts and rapids, is, according to Mr. Stanley, 1,630 feet above the sea, while 270 miles further north on the Nile the elevation is 1,500 feet. In lat. 58′ in this region, which is about midway between the two oceans, the mean shade temperature seldom exceeds 74°; and the climate, though not by any means a dry one, is far more healthy and agreeable than the clammy humidity of the East Coast. Near the East Coast, says Mr. Stanley, I found it dangerous to walk out without a sun-umbrella, while on the Central Congo a white double-cloth cap afforded sufficient protection even under a bright sun. Although here, when sitting down in the boat, an umbrella was necessary, at Stanley Falls an umbrella is not needed while working in the sun, and the nights are so cold that a couple of blankets are required. In January and February, under the cooling influence of southerly and south-westerly winds, the early morning temperature is 64°; from 10 a.m. to 4 p.m. it is from 75° to 85°; from 4 to sunset, from 72° to 80°. From January to March there is no rain, and Mr. Stanley says that he himself and his companion Pocock enjoyed better health on the Upper Congo than any place in Africa.

Between and around the great lakes of Victoria Nyanza, Albert Nyanza, and Muta Nzige, and even away south-west to Lake Tanganika, the whole region is a high plateau, with a rich soil, and a beautiful diversified appearance. The three former lakes lie either on the equator, or within a degree or two on either side of it, while the fifth parallel of such latitude passes through Lake Tanganika. Elevation of Lake Albert is 2,700 feet, Victoria 4,000, Tanganika 3,000. Of these countries, the most famous, most fertile, and most powerful, and that possessing the most beautiful climate, is Uganda, with its dependencies, Unyoro and Usoga, between Lakes Albert and Victoria; Ankori Rhuanda

and Karagwe lie between Victoria and Muta Nzige, and Usukuma, Unyaniwezi, Uhha, Urumoi, Ugara, and Ugomba between Victoria and Tanganika. Kafurro, between Uganda and Muta Nzige, is 3,950 feet above the sea, while a ridge close by, which overlooks the beautiful Alexandra Valley, has an elevation of 5,350. Karagwe has magnificent scenery, with numerous ferruginous alkaline hot springs, which are well attended by the natives for various disorders. The soil of all these countries is usually fertile, yielding bananas, grain, cassava, as well as milk and honey, in abundance. Flocks and herds are extremely numerous, and the population, though varying in density, and in some countries most hostile and savage, is in Uguanda about three millions, or thirty-eight to the square mile.

The elevation of Uguanda is from 4,000 to 6,000 feet. Looking down from the plateau of Uzimba at an elevation of 4,700 feet, the lake of Mata Nzige is seen 1,500 feet below. The countries round Lake Tanganika are of a somewhat lower elevation. The Livingstone or Congo flows west at first through the country of the Manyemas at an elevation of about 2,000 feet, and then north to Stanley Falls. The climate is similar to that around Stanley Falls already described. The country between the Great Lakes and the East Coast—a distance of about 600 miles, though at a considerable elevation above the sea—is not so salubrious or fertile as those immediately round them. These countries are Ugura, Unyamuesi, Usukuma, Ituru, Ugogo, and Usagara.

Usukuma, immediately south of Lake Victoria, is a fair, fertile, and healthy district, and Usiba is a beautiful pastoral region. Ituru, nearer the coast, has an elevation of about 4,000 and 5,000 feet, but is not a very favourable district; while at Chiwgu, 400 miles north-west of Bogomayo on the coast, the elevation is 5,400 feet. Kikombo is 2,700 feet high, and Camp Jeml, where there is much ophthalmia and rheumatism, 3,150 feet. Ugogo is a bare grain-producing region, and between the latter and

Usagura is the desert of Ugogo. Usagara is a hilly and mountainous district, from which exceedingly cold, fever-producing wind blows down on its plains. Kitanga, still nearer the coast, is a rich, pastoral basin with numerous flocks and an elevation of 2,670 feet. Ujiji, on Lake Tanganika, has a pleasant climate, the greatest heat being about 80° in the shade.

These latter countries are within the German sphere of influence, and are, as a rule, very unhealthy, particularly in wet seasons. The Tse-Tse fly, so destructive to horses and cattle, exists in many regions between the coast at Bagamoyo and Lake Tanganika. North of the German territory is the country between the coast and Lakes Victoria and Albert. Many parts of this country enjoy a delightful climate, and Massailand is generally a healthy country, the elevation being between 3,000 and 6,000 feet. The climate is so dry that the lower plains or terraces are often without water, and the people with their flocks move up and down according to the season. The higher plateau lands are healthy and well watered, and suited to colonization; cattle abound, the Tse-Tse fly is unknown, and the same may be said of Uganda, which is also within the British sphere of influence. The higher lands are pleasant and diversified, and generally well wooded. The rhinoceros, the zebra, the buffalo, and deer abound; and further north, round Lake Baringa, the elephant is still numerous. The higher regions of Massailand are not unsuited to delicate-chested young people. The mean temperature of Uganda is in March 71°, and in August 86°; rain every month, but heaviest in October and April; climate breezy and healthy.

SOUTH-CENTRAL AFRICA.

In addition to the foregoing section, the author thinks it will be useful to say a very few words on the new countries of South-Central Africa, that are at present being more or

less rapidly opened up to British civilization by pioneers from Cape Colony and England.

This region consists of the following countries, viz., Bechuanaland, Metabeleland, Barotse, Nyassaland, Bangueolo, Mashonaland, and Manicaland, and is bounded on the north by the Congo State, Lake Tanganika, and German East Africa, on the east and west by the Portuguese colonies of Mozambique and Angola, and on the south by the Transvaal and Cape Colony. Lat. between 23° and 9° S.

Bechuanaland is a sandy, sun-baked upland desert region, with a burning sun by day, showing a temperature of 100° at mid-day and frost in the mornings.

Dry nullas or watercourses intersect the country, except in April, when during the short rainy season they become converted into rushing torrents. There are many salt and other lakes, while along the marshes of the Zuga River and the grassy flats of Lake Ngami the elephant and the hippopotamus abound, as does the ostrich in the other parts of the country. The colonization attempts are at present confined to the south-eastern fertile parts, and to the district round Lake Ngami. The country is almost without native inhabitants, and, though not fertile, is, as far north as the 22nd degree, one of the healthiest in the world. Further north the prevalence of fever and the Tse-Tse fly are prohibitory of European occupation. The bite of the Tse-Tse fly, the horse-fly of Africa, is fatal to horses and cattle, but harmless to man. Many regions at present uninhabitable, when denuded of the jungles which harbour the flies, will, no doubt, become habitable. This is a good climate for the young with a phthisical tendency or even incipient consumption, with good physical strength.

Metabeleland lies north-east of Bechuanaland. It is mostly a high plateau, traversed by a central range of hills, and consequently has a fair amount of rain, a good deal of vegetation, and numerous tracts of stunted timber trees; there are also many blooming and very fertile valleys. The climate is dry and very healthy, the main features

being scorching midday heat, with cold and even frosty nights. It is *par excellence* the land of the golden mines, and is well adapted for young poitrinaires.

Barotse.—This is a land of swamps, rivers, lakes, still bayous, and inundations, except the table-land between the rivers Zambesi and Kalompe, wherein is situated the great Victoria Falls. Except this table-land, which is probably colonizable, the country is very feverish and unhealthy. It has a large population, is very fertile, and is a splendid country for sport.

Bangweolo is a fertile land of rivers, marshes, lakes, streams, hills, and woodland. Besides, there are the high plateau lands of Iramba and Lobema. There are mines of gold, copper, and iron, and certain parts of it are suitable to cattle-rearing, as the Tse-Tse fly, according to Mr. Johnston, confines its depredations to the Zambesi basin. The rainfall is abundant, and the population numerous. By the shores of Lake Bangweolo Livingstone's heart and entrails are buried. Its northern boundary is the Congo State and the Tanganika Lake, in about the 9th degree of south latitude.

In Mashonaland you lose the thorny bush of Bechuanaland, but the trees, though no longer thorny, are stunted, until you get beyond the Zuli, when the Veldt becomes more open and the trees much larger. On the high Veldt the country is flat and sandy, with plenty of grass and water, with stunted trees. The altitude at Fort Victoria is 3,700 feet, with a gradual ascent to Fort Charter, 5,000 feet; Fort Salisbury is 4,900 feet, and Mount Hampden 5,600 feet.

The high plateau extends far beyond Fort Hampden, when the country falls gradually to the Zambesi. It is a good country for cattle and tillage, and the most elevated plateaux are suited to European colonization. It is approached in three days by rail from Cape Town to Vryburg, the capital of British Bechuanaland, and thence by waggon over a distance of 520 miles to Macloustie, which takes

about a fortnight. Want of water is sometimes a serious matter along the line of route, but Mashonaland is said to have plenty of water, and the climate is healthy.

Eventually the route will be through the Manica country, claimed by the Portuguese, to Pungwe Bay, which is only 250 miles from Mashonaland. Manicaland is a magnificent well-watered region, with rolling hills running up to 6,000 feet. It is also rich in minerals, has a large population, a dry, healthy climate, and produces rice, sweet potatoes, beans, bananas, and tomatoes in abundance. In all these regions the natives are well disposed towards Europeans.

Nyassaland is the most favourable country for white colonization. In the south are most salubrious uplands, and some hilly districts already prosperously occupied and colonized by Europeans—as are also the equally healthy districts north of Lake Nyassa, and south of Lake Tanganika. In fact, the greater part of this region is comprised of high plateaux and rolling upland, fertile parks, whose elevation, rising from 3,000 to 7,000 feet, easily admits of profitable, successful, healthy, and pleasant European colonization. In the parts removed from the rivers, which are numerous, the water supply and rainfall are, however, often deficient, and the Tse-Tse fly is to be found in Loangua Valley. The chief products are beef, butter, milk, maize, millet, honey, oranges, lemons, and bananas.

The country is almost everywhere healthy; the natives tractable and industrious, and from the description of Mr. Johnston of Blantyre, it must be a second and improved edition of Sweet Auburn—

> 'Where health and plenty cheers the labouring swain,
> And smiling spring perpetually doth remain.'

The Management of African Fevers.

A word in conclusion as to the management of African fevers. There are two main varieties, the continued and intermittent. The former is generally remittent, with

a daily accession of fever. It is apt to attack newcomers, is often attended with delirium, and is frequently fatal. The intermittent is safe and mild, and mostly attacks those who have previously suffered from the continued variety. As it is principally due to exposure to wet, no traveller should, if possible, undertake a journey in the wet season, which in the countries between the great lakes on the East Coast commences about the middle of March. In the treatment of these fevers, especially of the dangerous form, quinine is comparatively valueless, till the system is prepared for its use, either by the simultaneous or previous administration of purgative and hepatic medication. When in Burma my most effectual prescription was a powder containing 5 grains of quinine, $\frac{1}{4}$ grain of podophyllin resin, 4 grains of James' powder, and 4 grains of nitrate of potash. After a few doses the quinine may then be continued alone. There are many, however, who are unable to take quinine till the system is previously prepared, which can be done by a couple of pills, composed of 8 grains of compound colocynth pill, $\frac{1}{4}$ grain of podophyllin, and 2 drops of oil of cajeputi. No traveller or resident in remote parts should rely on the same purgative dose, which from repetition is apt to lose some of its effects. He should provide himself with calomel, podophyllin, colocynth, and jalap resin. Epsom and Glauber salts are also very useful, and everyone should provide himself with Kutnou's Carlsbad powder, which being pleasant, as well as safe and effectual, is preferable to either. Livingstone's favourite dose was calomel, 2 grains, and resin of jalap, 3 grains, in pill, with a little tincture of cardamoms. This he took on the onset of the languor and lassitude that ushers in these African fevers.

Most of these medicines are now prepared in the form of a small lozenge, or *tabloid*, with the doses attached, by Messrs. Borroughs and Wellcome. For purity, permanency, convenience, and portability combined, they cannot be equalled; they are, therefore, of the greatest utility, especially to all who go into remote countries, or

are otherwise beyond the reach of medical advice. But whatever care be taken to avoid the dangers of the African, and, indeed, I may also say of other tropical climates, or whatever skill be shown in the administration of medicines (and the hypodermic tabloid should not be forgotten), all will be of no avail without strict sobriety and temperance in all things; for neither habitual tipplers, nor heavy opium or tobacco smokers, with weakened internal viscera, nor those who are slaves to other vices, can hope to live long in tropical climates; and the loss of but one in thirteen of the European members of the Emin Pasha relief expedition is, in my opinion, the strongest evidence that can be adduced of the perfect conduct of this expedition in all its relations.

I wish, in conclusion, to reiterate my opinion that these countries of equatorial and tropical Africa are unsuited to the first degree of colonization, as explained on page 15 of this book. Any settlement of the labouring agricultural emigrants of Northern Europe—unless, indeed, they are prepared to intermarry with the natives—will be certain to end in a failure; the fatigue incident to hard work in the sun, especially where there is no cold season, will be fatal alike to their comfort, their health, and fertility. Central Africa is, however, in many parts well adapted to the second degree of colonization, such as we see in Mauritius, North Queensland, or Louisiana, where, the dark races doing the work in the fields, the planters, merchants, and overseers enjoy good health, and bring up their children pretty much as at home.

ERRATA.

Page 12, line 2 from bottom, *for* '1880,' *read* '1887.'
Page 64, line 25, *for* 'the most,' *read* 'one of the most.'
Page 81, line 2, *for* 'Paris,' *read* 'Pau.'
Page 103, line 3, *for* 'Varaggio,' *read* 'Viareggio.'
Page 173, line 3 from bottom, *for* '1877,' *read* '1887.'

INDEX.

Abano, 145
Abazzia, 137
Aberystwith, 65
Abruzzi, 143
Abyssinia, 198
Acclimatization, 3
Aci Reale, 148
Acqui, 145
Adal, 199
Aden, 160
Afghanistan, 175
Africa, 191, 261
 Central, 202, 265, 270
 East, 199, 263
 North, 192
 North-east, 196
 South, 205
 West Coast of, 200
African islands, 211
Air, purity of, 30
Aix la Chapelle, 124
Aix les Bains, 92
Aix, Pyrenees, 91
Alaska, 220
Alassio, 102
Albisbrunnen, 114
Alexisbad, 130
Algeria, 192-3
Algiers, 193
Allevard, 92
Alum Bay, 60
Amelie les Bains, 91
America, Central, 223
 North, 213
 South, 226
Amphion, 87
Anahuac, 224
Andermatt, 114
Annam, 182
Annecy, 80
Antibes, 99
Arabia, 159
 diseases of, 160
Arcachon, 81
Arco, 137
Arctic regions, 33
Argentine Republic, 233
Ashby, 69
Asia, tropical, 158
 Minor, 184
Atlantic Ocean, 254
Audierne, 86
Ault, 84
Austen City (Tex.), 220
Australia, 243
 South, 246
 West, 247
Austro-Hungary, 132
Avant, les, 114
Azores, 143

Baden, Austria, 134
 Switzerland, 107
Baden-Baden, 125-8
Badenweiler, 124
B. de Bigorre, 87
B. de Luchon, 90
B. de l'Orne, 91
Bahamas, 237
Balaruc, 93
Balearic Isles, 142
Bangalore, 166
Barcelona, 141
Bareges, 90
Barmouth, 65
Barotse, 210, 171
Bath, 70
Baths, gas, 45
 inhalation, at, 46
 mud, 44
Baths, peat, 44
 pine, 44
 sand, 45
Bauche, 96
Beaulieu, 97
Beaumaris, 66
Belgium, 120
Bengal, 165
Bex, 114
Beyrout, 185
Biarritz, 81
Birchington, 53
Blackpool, 67
Blankenbergh, 120
Bloemfontein, 206
Bocklet, 130
Bognor, 57
Bolivia, 232
 salubrity of, 233
Bombay Presidency, 168, 172
Bordighera, 101
Bormio, 145
Boulogne-sur-Mer, 84
Bourbon Archambault, 93
 les Bains, 92
Bourboule, la, 96
Bournemouth, 61
Braemar, 73
Bray, 75
Brazil, 228
Bridge of Allan, 74
Brighton, 56
Broadstairs, 53
Bruckenau, 132
Buenos Ayres, 233
Bundoran, 76
Burmah, Lower, 178
 Upper, 179
Buxton, 67

Cabourg, 86
Cairo, 197, 262
Calabria, 144
Calais, 83
Calcutta, 165
Caledonia, New, 242
California, 217
Cambo, 89
Campfer, 113
Canada, 222
Canaries, 116
Cannes, 98
Canstatt, 128
Cape Town, 209
Capevern, 89
Caratraca, 139
Carlsbad, 134
Cashmere, 175
Catania, 148
Catini, Monte, 146
Caucasus, 153
Cauterets, 90
Cestona, 140
Ceylon, 175
Challes, Savoy, 91
Chalybeate waters, 41
Chamonix, 114
Chateauneuf, 94
Chatelguyon, 94
Chaudes Aigues, 94
Cherbourg, 86
Cheltenham, 71
Chili, 235
China, 185
 salubrity of, 187
 Cochin, 176, 182
Clacton, 53
Climate, definition of, 1
 influence of sun on, 2
 colonization of hot, 3
 elevation, effect of, on, 9
 mountains, effect of, on, 10
 mountains, effect on disease, 12
 in India, 12
 in Mexico, 13
 acclimatization of, 15-17
 consumption, influence of elevation on, 18
 sea, influence of, on, 19
Climates, characteristics of, 30
Climates, cold, 32
 equatorial, 30
 Polar, 33
 tropical, 31
 sub-tropical, 31
 temperate, 32
 therapeutical division of, 33
 cold, effect of, 8
 hot, action on the air, 4
 effect on the body, 5
 effect on the blood, 6
 effect on the organs of generation, 7
 effect on active disease, 7
Colorado, 216
Congo, 203, 264
Contrexeville, 88
Corea, 189
Corfu, 149
Corsica, 115
Craddock, 209
Cransac, 89
Cromer, 52
Crotoy, 84
Cures, dry diet, 47
 grape, 47
 milk, 48
 whey, 48
Cyprus, 151

Davos Platz, 108
Dawlish, 62
Dax, 87
Deccan, 164
Denmark, 154
Dieppe, 85
Dordrecht, 209
Douarnenez, 86
Dover, 54
Dovercourt, 53
Driburg, 130
Droitwich, 69
Dunkheim, 129
Dunkirk, 83

Eastbourne, 56
Eaux Bonnes, 90
 Chaudes, 90
Eggischhorn, 114
Egypt, 196, 261
 salubrity of, 197
Elevation of land, 9
Elster, 132
Ems, 129
Engadine, 112
England, 49
 seaside resorts, 51
 springs, 67
Equador, 226
Escaldas, 91
Etretat, 85
Evian, 87
Exmouth, 62

Fachingen, 130
Falmouth, 63
Farnborough, 71
Felixstowe, 52
Filey, 52
Florida, 218
Folkestone, 54
France, climate of, 79
 mineral springs, 87
 seaside resorts, 83
Franzensbad, 136
Freshwater, 60
Friedrichshall, 132

Gastein, 134
Genoa, 102
Georgia, 217
Germany, 122
Gibraltar, 141
Glion, 114
Graaf Reinet, 208
Grahamstown, 208
Grange, 67
Greece, 148
Griesbach, 131
Guiana, 227
Guinea, New, 240

Hanover, 123
 South Africa, 209
Harrogate, 68
Harwich, 53
Hastings, 55
Hayling Island, 57
Holland, 121
 seaside places, 122
Homburg, 126
Hong-Kong, 187
Houlgate, 86
Hoylake, 67
Hunstanton, 52
Hyères, 98

Iceland, 155
Ilfracombe, 65
Ilkley, 71
India, 161
 hill sanatoria, 168, 170, 172
 rainfall of, 161
 salubrity and diseases of, 172
 seasons, 146
Ireland, 74

Japan, 189
Java, 239
Jersey, 77
Johannisberg, 207

Kaltbad, 114
Kansas, 217
Karoo, Great, 206
Khiva, 189
Kilkee, 76
Kimberley, 210
Kingstown, 75
Kissingen, 125
Königswart, 136
Kreuznach, 127
Kronquelle, 130
Kronthal, 127

Llandrindod, 69
Llandudno, 66
Leamington, 70
Leuk, 106
Liebenzell, 128
Lippespringe, 124
Lisdoonvarna, 77
Lombardy, 146
London, 50
Louisiana, 218
Lynton, 65

Madagascar, 211
Madeira, 118
Madras, 166
Malaga, 140
Malarial fevers, 31, 273
Malasia, 239
Malta, 115
Malvern, 71
Malu, le, 96
Manchuria, 189
Man, Isle of, 77
Margate, 53
Marienbad, 135
Marlios, 92
Martigny des Bains, 89
Mauritius, 212
Mehadia, 134
Meinberg, 125
Melanasia, 239
Meran, 136
Mercara, 166
Mexico, 223
Mineral waters, 35
 action of, 36
 alkaline, 39
 chalybeate, 41
 contents of, 35
 definition of, 35
 division of, 36
 earthy, 39
 exported, 43
 indifferent, 38
 iodo-bromated, 43
 lithia, 43
 purgative, 41
 saline, 42
 sulphurous, 40
Moisture, 24, 25
Mombassa, 199
Morecambe, 67
Monaco, 100
Monte Carlo, 100
Mont Doré, 95
Montreux, 114
Morocco, 194
Mountain ranges, 25
Münster, 127
Mysore, 167

Nantwich, 69
Naples, 146
Natal, 207
Nauheim, 128
Nelson, 251
Neundorf, 125
Nepaul, 175
Neris, 96
Nervi, 102
Neuenahr, 130
New Guinea, 240
New Mexico, 216
New Quay, 64
New South Wales, 244
New York, 216
New Zealand, 249
 mineral springs, 251
 salubrity of, 250
Nice, 99
Norway, 153
Nowera Ellia, 176

Obermair, 137
Olette, 91
Orange County, 218
Orotova, 118
Ostend, 120
Otto's Cave, 135

Palermo, 147
Palestine, 184
Pallanza, 147
Palmas, las, 117
Panama Canal, 227
Panticosta, 139
Paraguay, 234
Pau, 82
Pegli, 102
Pekin, 186
Pennsylvania, 217
Penzance, 64
Persia, 183
Petersthal, 131
Pfeffers, 106
Plombières, 87
Polynesia, 240
Pongues, 89
Pontresina, 113
Pornic, 86
Port Elizabeth, 208
Portugal, 142
Presse, la, 108
Preste, la, 91
Pretoria, 207
Pullna, 135
Purton, 71
Pyrmont, 130

Queenstown, 76, 208
Quilotta, 236

Ragatz, 106
Rainfall, 23
Ramsgate, 54
Rapallo, 102
Redcar, 51
Rehme O., 129
Reinerz, 132
Reunion, 212
Rhyl, 66
Rippoldsau, 131
Riviera, 97
Rohitsch, 136
Rome, 146
Romerbad, 134
Rosslare, 75
Rosstrevor, 76
Rothsay, 73
Royan, 86
Royat, 95
Rubinat Condal, 140
Russia, 151
 diseases of, 152

Sacedon, 139
Sahara, 202
Salcombe, 62
Saltburn, 52
Salzbrunn, 130
Salzburg, 133
Salzschlirf, 127
Samaden, 113
Sandgate, 55
Sandown, 58
Sandwich Isles, 241
San Paulo, 230
San Remo, 101
San Sebastian, 141
Santander, 141
Sardinero, 141
Sardinia, 148
Scarborough, 52
Scheveningen, 122
Schinznach, Switzerland, 107
Schlangenbad, 124
Schwalbach, 131
Scilly Isles, 65
Scotland, 71
Sea bathing, 257
Sea sickness, 252
Sea voyages, 253
Seville, 141
Shanghai, 186
Shanklin, 58
Shap, 69
Siberia, 190
Sicily, 147
Sidmouth, 62
Sites, selection of, 29
Society Isles, 241
Soden, 127
Soil, 26
Southampton, 58
Southend, 53
Southport, 66
Southsea, 57
Spa, 121
Spain, 138
Spezia, 102
Stachelberg, 107
St. Amand, 89
Steben, 130
St. Honoré, 91
St. Ives, 64
St. Jean de Luz, 86
St. Leonards-on-Sea, 55
St. Malo, 86
St. Moritz, Engadine, 108, 113
Strathpeffer, 73
St. Sauveur, 90
St. Valery, 84
Swanage, 62
Switzerland, 104
 mineral springs, 106
 mountain resorts, 108
 tuberculosis in, 106

Tarkestad, 209
Tangier, 194
Tarasp, 108
Tasmania, 248
Teignmouth, 62
Teinach, 130
Tenby, 65
Teneriffe, 116
Teplitz, 133
Thibet, 188
Tobelbad, 134
Torquay, 63
Totland Bay, 60
Transvaal, 206
Treport, 84
Trichinopoly, 167
Tripoli, 196
Tuberculosis on mountains, 106
Tuffer, 134
Tunbridge Wells, 71
Tunis, 196
Turkestan, 188
Turkey, 150

United States, 213
 mountain resorts, 220
 salubrity of, 221
 seaside resorts, 219
 springs, 220
Uriage, 92
Uruguay, 235

Vals, 94
Vegetation, 27
Vernet, 91
Veules, 85
Viaregio, 147
Vichy, 93
Vic sur Cere, 94
Victoria, 244
Vittel, 88
Vivi, 204

Weilbach, 124
Weston-super-Mare, 65
Weymouth, 62
Wiesbaden, 127
Wiesen, 112
Wight, Isle of, 58
Wildbad, 124
Wildungen, 131
Worthing, 57

Zanzibar, 119, 263

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